Division of Agricultural Sciences
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GROWER-PROCESSOR COORDINATION IN THE CALIFORNIA BROILER INDUSTRY

John A. Jamison

CALIFORNIA AGRICULTURAL EXPERIMENT STATION
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FOREWORD AND ACKNOWLEDGMENTS

This study is a part of a broad research program being carried on cooperatively by many of the State Agricultural Experiment Stations and the U. S. Department of Agriculture concerning various aspects of integration in agriculture. This report emphasizes the relationship between broiler processing firms in California and their suppliers of live birds. Its purpose is to describe the interfirm arrangements present and to analyze some causes and effects of the methods used to coordinate grower and processor operations.

The study was made by the Giannini Foundation of Agricultural Economics, California Agricultural Experiment Station, in cooperation with the Marketing Economics Research Division, Agricultural Marketing Service, U. S. Department of Agriculture.

The author expresses his sincere appreciation for the generous cooperation of the California broiler processors and other industry members who were interviewed in the course of the study and to the governmental officials who provided needed information at various stages of the project. In addition, the author is particularly indebted to Norman R. Collins for his assistance in planning the study and his guidance during its progress. The helpful comments and suggestions of Norris T. Pritchard and many others in the Marketing Economics Research Division are gratefully acknowledged.

Acknowledgments

This study is a part of a broad research project being carried on cooperatively by many of the state agricultural experiment stations and the U. S. Department of Agriculture. Our research methods consist of interviewing in original sources. The research organization for relations between [illegible] economical farms in California and the [illegible] of farm owners. [illegible] to determine the trends in [illegible] and to analyze [illegible] and effects of the trends and to coordinate farmer and economic research.

The study was made by the [illegible] under the general direction of Dr. [illegible], California Agricultural Experiment Station, in cooperation with the Bureau of Agricultural Economics, Agricultural Adjustment Administration, U. S. Department of Agriculture.

The author acknowledges the interest expressed by the numerous agricultural of the California Sugar Producers and other industry officers who have helped in the course of the study and in the preparation of this report. Valuable information was obtained from [illegible] of various phases of the industry. In addition, the author is particularly indebted to Dorsey V. [illegible] for his assistance in planning the study and in guidance during its progress. The typical farmers and supervisors of farms [illegible] Fitzhugh and many others in the industry who [illegible] are gratefully acknowledged.

GROWER-PROCESSOR COORDINATION IN THE
CALIFORNIA BROILER INDUSTRY

by

John A. Jamison[1]

I. Introduction

Determination of the factors encouraging the development of vertical integration in agriculture is an important objective of much current research in agricultural marketing. Emphasis can be focused on the economic issues involved in the development of new processing techniques, improvement of facilities, or adaptation of other technical procedures for more efficiently performing marketing functions. Another research gives principal attention to the economic problems relating to the use of the marketing system as a coordinating mechanism for the decisions made with respect to each of the marketing functions performed. This study considers the latter range of problems as they exist in the California broiler processing industry with particular emphasis on the coordination of decisions on matters of mutual interest to the processor and his suppliers of live birds.

The responsibility for accomplishing the myriad of physical actions necessary to present a finished food product to the consumer is divided among many persons and firm units. This reflects the high degree of specialization existing in our economic system. But while performance responsibility is largely divided, the decisions made at each level are not unrelated. The actions taken by the broiler grower, for example, may very well affect the decision possibilities at the processing level. In fact, to take full advantage of technical specialization in the performance of the large number of economic tasks it is necessary to develop a coordinating mechanism which brings into balance the actions taken by a multitude of individual firm units.

Major adjustments have occurred in the structure of the food market at the retail, wholesale, and processing levels. Farmers in many areas and for many commodities do not produce for the kinds of markets represented by auctions, public stockyards, or commodity exchanges. These markets were designed to absorb

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1/ Cooperative Agent, Agricultural Marketing Service, U. S. Department of Agriculture; and Assistant Specialist in the Agricultural Experiment Station, College of Agriculture, University of California.

[illegible]

[illegible]

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whatever quantities and types of products were supplied by growers who often possessed only limited information concerning the relationship between desired patterns of production and demand specifications of processors, retailers, and consumers. The kinds of supplies available on the typical "open" market seldom satisfy the requirements of mass production or mass merchandising; that is, large and stable supplies of a product of uniform and acceptable quality.

These changes in the food market are reflected at the producer level in terms of altered choice of product and product characteristics, scale of farm unit, and method of operation. The functions necessary to move food from the grower to consumer are becoming highly coordinated units of a single system designed for an ever-enlarging volume of food production. To say that the performance of these functions is increasingly coordinated is to imply a change in the decision-making process. For to coordinate the performance of several economic activities means that the selection of individual courses of action is not made without regard for the selection of others.

Total resource use in production, processing, and distribution operations can only be minimized if the actions of firms performing these interrelated activities are effectively coordinated. The coordinating system used must encourage firms at one level to plan their operations by taking into consideration the effects of their actions on the profit determinants of the firms at preceding and succeeding levels. If such coordination is not achieved, many of the economic gains from specialization may be lost. It seems evident, for example, that unless specialized broiler growers take into consideration the effects of raw product attributes on the processing costs of specialized broiler processors, the total costs of production and processing may be considerably increased.

The Role of Price--Communication and coordination in agricultural marketing have long been performed by prices set within a so-called "open market" system. These prices were determined on such markets as the grain exchanges or terminal fruit auctions by many buyers and sellers. The buyers and sellers met at the time of sale and each buyer selected from the products available those with the characteristics which best fulfilled his requirements. The grower made his adjustment to buyer's requirements after translating market prices paid for various offerings into a set of specific production practices.

Prices established in the market summarize a great deal of information concerning product attributes. The arguments for the use of prices determined on

whatever quantities and types of products were supplied by farmers who often produced only limited information concerning the relationship between grading practices of handlers and crop specifications of processors, retailers, and consumers. The kinds of supplies available on the typical "per" market reflect mainly the requirements of mass production or mass merchandising; that is, large and stable supplies of a product of uniform and acceptable quality.

These changes in the food market are reflected at the producer level in terms of altered choice of product and product characteristics, scale of farm unit, and method of operation. The innovations necessary to move food from the farmer to consumer are becoming highly coordinated units of a single system designed for an ever-enlarging volume of food production. It is in that the participants of this function is increasingly coordinated to simply a single in the decision-making process. For to coordinate the performance of several economic activities means that the selection of individual courses of action is made with without regard for the selection of others.

Total resources used in production, processing, and distribution operations can only be minimized if the actions of firms performing these interrelated activities are effectively coordinated. The coordinating system has to be in some firms at one level to plan their operations by taking into consideration the effect of their actions on the profit determinants of the firms at previous and succeeding levels. If such coordination is not achieved, many of the economic gains from specialization may be lost. In some instances, for example, that unless specialized storage or processing has into consideration the effects of any product attributes on the processing costs of specialized broiler processors, the total costs of production and processing may be greatly increased.

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Prices established in the market transmitted a great deal of information concerning product attributes. The arguments for the use of prices determined in

an "open market" are largely based on the economy involved in this summary figure. However, it seems apparent in agricultural marketing, as well as in other industries, that other methods than price are increasingly used to coordinate buyer and seller activities. This may be accomplished by complete integration; that is, ownership of production, processing, and distribution facilities by one firm, which reduces the exchange transaction to an intrafirm transfer and makes possible a high degree of coordination. However, the major variation from the use of price alone to perform this coordinating function can be described as incomplete integration. Under this form of integration, coordination is achieved through various types of contractual agreements or other administrative arrangements. Firms participating in these agreements agree to make jointly acceptable decisions concerning variables which affect their respective profit accounts.

The integrating arrangements found in many sectors of the broiler industry are examples of incomplete integration which has resulted in a high level of interfirm coordination. As numerous studies of integration in the broiler industry have pointed out, these firms deal with each other under the terms of some type of administrative arrangement--often a formal contract.[1/] Similar instances

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1/ The following recent studies are among those covering integrating relationships within the broiler industry:

Agricultural Experiment Stations of Alabama, Arkansas, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas, and Virginia; and Agricultural Marketing Service, U. S. Department of Agriculture, Financing Production and Marketing of Broilers in the South, Part I: Dealer Phase and Part II: Grower Phase, Southern Cooperative Series Bul. 38 (June, 1954) and Bul. 57 (June, 1958).

Frank D. Hansing, Financing the Production of Broilers in Lower Delaware, Delaware Agricultural Experiment Station Bul. 322 (Newark, 1957), 38p.

W. W. Harper, Marketing Georgia Broilers, Georgia Experiment Station Bul. 281 (Athens, 1956), 42p.

O. C. Hester and W. W. Harper, The Function of Feed-Dealer Suppliers in Marketing Georgia Broilers, Georgia Experiment Station Bul. 283 (Athens, 1953), 39p.

Kenneth D. Naden and George A. Jackson, Jr., Financing Western Broiler Production, California Agricultural Experiment Station Bul. 753 (Berkeley, 1956), 32p.

Richard F. Saunders, Contract Broiler Growing in Maine, Maine Agricultural Experiment Station Bul. 571 (Orono, 1958), 38p.

U. S. Agricultural Marketing Service, A Summary of Selected Recent Studies on Broiler Financing and Contracting (Washington, 1957), 16p.

on "open market" are largely based on the economy involved in this account. However, it seems reasonable to speculate that, as well as in other societies, some, but not all, bridewealth prices are informally used to coordinate marriage and other exchanges. This may be accomplished by complaints, informations, [illegible], gossiping, and distribution. Prices, in turn, reflect the exchange [illegible] in the transfer and other exchanges a high degree of [illegible]. However, the [illegible] variation from the use of prices alone to [illegible] information can be conducted as [illegible] information. Under [illegible] of information, coordination is achieved through various types of institutions, [illegible] other social [illegible] and [illegible] information in [illegible] serve to [illegible] in different [illegible] [illegible] their respective social economy.

The [illegible] arrangements found in many societies of the Indian subcontinent are examples of [illegible] information which has resulted in a [illegible] institutions [illegible]. As numerous studies of [illegible] in the [illegible] have noted, these firms deal with each other under the terms of some type of [illegible] arrangement--often a [illegible] [1]. Similar [illegible]

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1) The following recent studies are among those covering [illegible] India's Indian [illegible]:

[illegible] Department Statistics of Jaipur, [illegible], Government, [illegible], Statistical [illegible], Government of India, [illegible], and [illegible] [illegible] Statistical [illegible]. [illegible] Department of [illegible]. [illegible] [illegible] in the South, [illegible] [illegible] [illegible]

of incomplete integration are often found between processors of other commodities and the growers of the raw product.[1]

Although there have been many improvements and refinements in the price reporting system used in conjunction with "open" agricultural markets, the trend has been away from the use of the prices made on these markets as major guides to specific production practices. Coordination required under today's conditions is apparently much greater than can be accomplished by a system of prices alone. Production plans require recognition of needed final product attributes well in advance of the exchange transaction. Although prices established in previous periods give some guidance to production decisions, these are not an adequate guide to future requirements. This is particularly true if the production plans must be made far in advance of sales--one or two years, for example. Under these conditions the need for direct negotiation on relevant variables is readily apparent. In this manner, activities at each level of the production and marketing system can be coordinated to a much closer degree and at a much more convenient time than by sole reliance on market prices.[2]

The Concept of Decision Areas.--Under conditions of incomplete integration, the nature of interfirm relationships can be conveniently studied by the introduction of the concept of "decision areas." A decision area can be defined as a range within which a number of possible decisions can be made with regard to some particular action to be taken. When the actions of one firm are not independent of actions taken by other firms, necessary decisions can be said to fall within a "joint decision area." In this case, the allocation of the decision-making authority is not usually clear cut. On the contrary, due to the mutual dependence of both performance units upon the actions taken, there is some jointly acceptable decision made which is influenced in some manner by the two parties.

1/ Norman R. Collins, Willard F. Mueller, and Eleanor M. Birch, Grower-Processor Integration, California Agricultural Experiment Station Bul. 768 (Berkeley, 1959), 77p.

R. G. Kline and M. E. Cravens, Grower-Processor Agreements in the Sweet Corn for Processing Industry, Ohio State University Experiment Station Research Bul. 806 and North Central Regional Publication No. 85 (Wooster, 1958), 47p.

2/ For a more complete discussion of price as a coordinating mechanism, see Collins, "Changing Role of Price in Agricultural Marketing," Journal of Farm Economics, vol. XLI, no. 3, August, 1959, pp. 528-534.

of incomplete information are often found between producers of other commodities and the prices of the new product.[1]

Although there have been many improvements and refinements in the price re-porting system used in conjunction with "open" multilateral markets, the trend has been away from the use of the prices now on these markets as sole guides to specific production decisions. Coordination required under today's conditions is apparently much greater than can be accomplished by a system of prices alone. Production plans require recognition of needed final product attributes well in advance of the exchange transaction. Although prices established in previous periods can serve as guides to production decisions, these are not as accurate guide to future requirements. This is particularly true if the production plans must be made far in advance of sales--one or two years, for example. Under these conditions the need for closer monitoring of relevant variables is readily apparent. In this manner, activities at each level of the production and marketing system can be coordinated to a much closer degree and at a much more convenient time than by sole reliance on market prices.[2]

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1/ Warren R. Quance, Willard W. Cochrane, and Glenn L. Nelson, Commodity Procurement Programs, California Agricultural Experiment Station Bul. 708 (Berkeley, 1951), 119.

2/ G. Allen and A. G. Clayton, Production-Processing Interests in the Sugar Cane Industry (London, 1956), 119. See also University Agricultural Experiment Station Bulletin 708, 25 (Berkeley, 1951), 19.

3/ For a more complete discussion of prices as a coordinating mechanism, see Collins, "Marketing Role of Prices in Regional Farm Firms," Journal of Farm Economics, vol. XLI, no. 3, August, 1959, pp. 521-534.

Analysis of decision making under conditions of incomplete integration, such as is predominant in agricultural industries, requires the definition of important joint decision areas and study of the process through which decisions in respect to the applicable variables are reached. The decisions made concerning the variables within each area result in the observed performance of the various segments of the industry.

The development of integrating arrangements between industry segments can be viewed as evidence of the increasing importance of coordination of decisions concerning the variables in each area. Explicit in most integrating arrangements is the transfer of varying amounts of decision-making responsibility among the parties to the arrangement. Under complete integration, the identification of the locus of the responsibility is relatively easily accomplished. However, under conditions of incomplete integration, it is seldom readily apparent.

This study presents some important factors in the decision-making relationship between broiler processors and their suppliers of live birds. Consideration is first given to the functions performed by the California broiler industry and the allocation of these functions among industry members. Attention is then focused on the nature of existing interfirm arrangements between processors and their live bird sources. Finally, three important joint decision areas in this relationship--quality of live birds, volume and timing of placements and deliveries, and price--are discussed in detail with emphasis on the extent and type of integration present.

II. Functional Segments of the California Broiler Industry[1/]

The basic functions required to furnish broiler meat to the consumer are production of the live birds, processing to the desired form, and distribution to retailers and other sales outlets. Attendant to these functions are those concerned with supplying essential production inputs, such as feed manufacture, breeding, hatching, and others such as financing, interlevel sales and transportation, freezing, and storage. The firms that perform these activities include growers, agencies contracting with growers for production, input suppliers, financing agencies, processors, truckers, freezers, storage companies, wholesalers, retailers, and various other types of sales agencies.

1/ The term "broiler" as used throughout this study refers to heavy breed and heavy crossbreed chickens raised as meat birds, which corresponds to the category "commercial broilers and fryers" used by the California Crop and Livestock Reporting Service. Except in San Francisco where broilers are differentiated from fryers on a weight basis, the terms broilers and fryers are generally used synonymously in the trade.

[illegible] of the observed performance of the various segments of the industry.

[illegible] readily apparent.

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III. [illegible] 1/

[illegible]

1/ [illegible]

Production

The 1954 Census of Agriculture showed that 2,150 California farms sold broilers in that year.[1] Although precise figures are not available, it is probable that the number of farms selling broilers in 1957 was smaller than in 1954 due to the general trend to increased farm size and to the fact that in 1957 there were 43,490,000 broilers produced in the state, which was 6,689,000 fewer than in 1954 (Appendix Table A-1).

Growing operations can be divided into two general categories--independent and contractual. The California Hay, Grain, and Feed Dealers Association has reported an estimate that 70 per cent of the broilers grown in California were grown under some type of contractual agreement in 1958.[2] Contracting agencies are usually feed suppliers although hatcheries are becoming increasingly involved in contract growing operations. Under the usual terms of these agreements, the contractor holds title to the birds, supervises the growing operations, and markets the finished broilers. The grower usually receives a minimum return for birds sold plus some additional payment based on feed conversion or a percentage of profits if the final price exceeds the guaranteed minimum.

Growers without these contracts are classified as independent. This category can be further subdivided according to the source of financing and the consequent extent of production supervision. Production financing is generally obtained from input suppliers, principally feed manufacturers, or from traditional lending institutions such as banks or production credit associations. Broiler growers financed by input suppliers, but not under minimum guarantee contracts, are less closely supervised than contract growers; however, in most of these cases a chattel mortgage on the chicks is held by the financing supplier. The degree of control over production and marketing exercised by the financing supplier usually depends upon the individual grower's experience and managerial skill. If production credit is obtained from traditional sources, no direct production supervision is exercised and marketing is left in the hands of the grower. A more detailed analysis of some features of these production arrangements is presented in Section III of this report.[3]

1/ U. S. Bureau of the Census, Census of Agriculture: 1954, California Counties and State Economic Areas (Washington, 1956), vol. 1, part 33, p. 87.

2/ California Hay, Grain, and Feed Dealers Association, Bulletin, July 26, 1958, No. 7, p. 1.

3/ See also, Naden and Jackson, 32p.

[illegible]

[illegible] [illegible] [illegible] [

Feed and chicks are the principal inputs required in broiler production. These two inputs usually account for about 80 per cent of broiler growing costs, with feed about 60 per cent and chicks about 20 per cent.[1] Feed supplies for California broiler growers are available from major terminal mills, usually through branches or dealers, from local independent milling companies, and from cooperative milling organizations. All production areas in the state are served by one or more firms in each of these categories.

In 1957, there were 152 chick hatcheries in California.[2] These provided growers with the major broiler strains available from the relatively few breeders providing national distribution. A study made in 1951-52 found that about 85 per cent of the hatcheries in California produced only the three most popular breeds.[3]

Processing

In 1957, there were 614 plants listed with the State Bureau of Poultry Inspection as processors of live poultry. The great majority of these were small operations, usually connected with a relatively small wholesale or retail business. As a part of this study, 21 processors operating 23 plants were interviewed. These plants, less than 4 per cent of the total number, handled approximately two-thirds of all California broilers processed in 1957 (Table 1). The survey sample was largely made up of the state's principal broiler processors, although several smaller operations were included. No attempt was made to study interfirm relationships involving the many very small broiler processing firms in the state.

There are three major geographic concentrations of broiler processors in California: the Los Angeles metropolitan area, the San Joaquin Valley between Fresno and Modesto, and the San Francisco Bay area. Processors generally draw their live-bird supplies from their immediate vicinity; however, Bay area processors draw some of their supplies from the Sacramento and San Joaquin Valleys,

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1/ Two studies detailing these costs are: James F. Miles and J. Verlon Minchew, Broiler Production in South Carolina, South Carolina Agricultural Experiment Station Bul. 415 (Clemson, 1954), p. 25; and Earnest M. Morrison and Thomas I. Gunn, Broiler Production in Utah, Utah State Agricultural College Experiment Station Bul. 359 (Logan, 1953), p. 9.

2/ California Crop and Livestock Reporting Service, Poultry and Hatchery Production in California, Summary for 1957 (Sacramento, 1958), p. 12.

3/ Naden and Jackson, Price and Production Policies of California Broiler Chick Hatcheries, University of California, Giannini Foundation Mimeographed Report No. 171 (Berkeley, 1954), pp. 27-28.

Fruit and vegetable canneries are the principal labor requirers in broiler production. These canneries usually operate for four months of the year (and of broiler growing season), with land owned by the cannery and contracts signed on per acre basis.[1] Feed supplies for California's broiler growers are available from major terminal mills, usually through brokers or dealers, from local independent milling operations, and from commercial milling operations. All production areas in the state are served by one or more firms in each of these categories.

In 1967, there were 121 hatcheries in California.[2] These operations varied with the major broiler producer areas, ranging from the relatively few hatcheries operating in coastal counties, to a wide range in 1967-68 found that about 40 per cent of the hatcheries in California operated only the three most popular strains.[3]

Processing

In 1967, there were 221 plants listed with the State Bureau of Poultry Inspection as processors of live poultry. The great majority of these were small operations, usually conducted with a relatively small workforce on a part time basis. In a sample of this study, 24 processors operating 27 plants were interviewed. Four plants, less than 10 per cent of the total number, handled approximately three-fourths of all California broilers processed in 1967 (Table 1). The survey showed the largest processor to be a totally vertical broiler processor, although several smaller operations were included. No attempt was made to study industrial broiler processing in any way which involves processing 12 or more birds.

Processing labor requirements in operations of broiler processors in California, the Los Angeles metropolitan area, the San Joaquin Valley, Sonoma County and Salinas, are the principal study areas. Processors generally draw their workforce from the immediate vicinity (except, for some processors, draw some of their workers from the Sacramento and San Joaquin Valley).

1/ Interviews with Robert Hines, Hines Farms, Lodi, and L. Allen and A. Vernon, Allen, Vernon, Montalvo & Smith Company, South Gardena Agricultural Commission, Los Angeles, Calif. (Interviews, 1968). 2. Calif. Department of Agriculture, Bureau of Poultry Inspection, Sacramento, Calif. (Interviews, 1968). 3. Robert Hines, Hines Farms, Lodi, Calif. (Interviews, 1968). Also, Calif. Agricultural College Extension Service, Davis, Calif. (Interviews, 1968).

2/ California Crop and Livestock Reporting Service, Poultry and Poultry Products in California, 1967, p. 1.

3/ Calif. Crop and Livestock Reporting Service, op. cit. (Interviews, 1968), p. 1.

4/ Calif. Dept. of Agriculture, Bureau of Poultry Inspection, Summary of Poultry Slaughter Inspection, Sacramento, Calif. (Interviews, 1968). Department Handbook (Interpretation Manual for Poultry Inspection, Sacramento, Calif., 1968), pp. 27-42.

TABLE 1

Distribution of Broiler Processing Plants Included in the Study and of Their Volume by Size of Plant California, 1957

Size of plant: normal weekly number of broilers processed	Broiler processing plants	Total weekly number of broilers processed		Production of these plants as percentage of total state production[a]
	number		per cent	per cent
Less than 10,000	4	18,000	3.1	2.1
10,000-14,999	7	76,000	13.5	9.1
15,000-29,999	4	85,000	15.1	10.2
30,000 or more	8	385,000	68.3	46.0
Total	23	564,000	100.0	67.4

a/ Total state production for the year 1957 was 43,490,000 broilers or 836,346 weekly; the latter figure is the 100 per cent total for the state.

Source: Total weekly production based upon total California production for 1957 as indicated in California Crop and Livestock Reporting Service, Poultry and Hatchery Production in California, Summary for 1957 (Sacramento, 1958), p. 7.

Table 1

Distribution of Medical Personnel Engaged in Clinical Medicine in the Armed and Civil Services by Sex, Year and Grade, 1971

Grade of Medical Personnel Engaged in Clinical Medicine	Number of Medical Personnel Engaged in Clinical Medicine	Total Medical Personnel Engaged in Clinical Medicine		Percentage of Total Medical Personnel Engaged in Clinical Medicine
	Men	Women	Total	Women
Top Grade (D/C)	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]

a/ Total Army personnel for the year 1971 was [illegible] 000 personnel or [illegible] women. The latter figure is the 1971 end year value for the Army.

Source: Total Army personnel and women [illegible] Personnel Branch, [illegible] (1971 and 1972) and [illegible] Civil Servants, Civil and Military Personnel, Statistics and Research Branch, Ministry of Defence, Whitehall, London, for 1971 (November 1972), p. [illegible].

and Los Angeles processors obtain a large part of their supplies from the Antelope Valley.

Among those surveyed, eight plants had a normal output of 30,000 or more broilers per week. The normal output of 11 plants was between 10,000 and 30,000 birds per week, and four plants processed fewer than 10,000 broilers per week (Table 1). The largest three plants processed between 60,000 and 80,000 broilers per week.

Seventeen firms had a single processing plant. Of the remainder, two companies each operated two plants in California, and two plants were units of national companies, each operating numerous poultry processing plants throughout the country but only one broiler processing plant in California.[1/]

All of the plants surveyed had some type of conveyor line for the killing operation, and nearly all had a conveyor set up for eviscerating and packing. Eviscerating facilities in the majority of the plants were less than five years old, and many of the individual pieces of equipment were less than three years old. Processing operations include killing, dressing, eviscerating, and packing. All larger plants eviscerate from 90 to 100 per cent of the birds processed. Of the plants included in the survey, only three sold more than 50 per cent of their volume in the New York dressed form. These plants each had a normal total output of less than 12,000 broilers per week. Eviscerated birds are sold whole, ice packed, or cut up and packed in individual trays. Most processors do some special cutting up for their customers, particularly for the hotel and restaurant trade. Less than 5 per cent of processed broilers are frozen.

Although there are many specialized turkey processors in California, about half of the broiler processors interviewed also processed turkeys. The total tonnage of turkeys processed by plants which handled more than 30,000 broilers per week was about equal to the total broiler and fowl tonnage of these plants. All except one of these larger processors processed some turkeys. Of those handling turkeys, the relative size of the turkey operation ranged from about half the broiler tonnage to almost four times as much. All of the plants processed some fowl, consisting primarily of hens culled from laying flocks and cockerels of the laying breeds. The total tonnage of fowl processed varied widely among the plants; among the larger operators, it ranged from about 5 per cent to as high as 45 per cent of total tonnage processed.

1/ Of the firms surveyed, 12 were corporations, 8 were partnerships, and 1 was a single proprietorship. There were no cooperatives processing broilers in California by the latter half of 1957.

All Los Angeles processors obtain a large part of their supplies from the [illegible] Valley.

Twenty-three processing plants had a normal output of 5,000 or more broilers per week. The normal output of 11 plants was between 5,000 and 10,000 birds per week, and four plants processed more than 10,000 broilers per week (table 11). The largest three plants processed between 60,000 and 70,000 broilers per week.

[illegible] County had a single processing plant of this [illegible]. [illegible] two plants in California, and one plant [illegible] poultry processing plants [illegible] but only one broiler processing plant in California.[1]

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Although there are many specialized turkey processors in California, about half of the broiler processors interviewed also processed turkeys. The total tonnage of turkeys processed by plants which handled more than 20,000 broilers per week was about equal to the total broiler and fowl tonnage of these plants. Although most of these larger processors processed some turkeys, [illegible], the [illegible] of the turkey operation ranged from about half [illegible] broiler tonnage to almost four times as much. [illegible] of the fowl processed, consisting primarily of hens culled from [illegible] flocks and [illegible] laying breeds. The total tonnage of fowl processed varied widely among the plants [illegible]. It ranged from about 1 per cent to [illegible] per cent of total tonnage processed.

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[1] Of the [illegible] surveyed, [illegible] were [illegible] proprietorships, [illegible] were partnerships, and [illegible] were corporations. There were no cooperatives processing broilers in California at the time of the study.

A function performed by many of the California firms interviewed, in addition to processing and sale of processed products, is wholesale distribution of poultry products purchased from other processors. The principal products handled this way are ice-packed broilers from out-of-state production areas and turkeys processed at other plants, usually within the state. Twelve firms, operating 14 of the plants included in the study, engaged in this type of business (Table 2). For five of these companies, this wholesaling function was the main part of their business; one of these processed about 30,000 local broilers per week, but the others usually handled 12,000 or less local birds per week. For two firms, it represented about half their business, and for three firms it was only a minor sideline. Two firms were units of national companies which maintained separate sales divisions to sell products processed by all of the firms' plants. The remaining nine firms operated single plants and sold only the products processed in these plants.

Only one firm included in the study was directly engaged in feed manufacture and distribution; however, one other was part of a company with a separate feed manufacturing division. Two processors operated hatcheries and two grew some of their birds on their own farms. One firm operated as a grower-contractor in the production of broilers.

Distribution of Processed Products

In 1957, California processors interviewed sold 51.7 per cent of their processed broilers to retail chains, 29.6 per cent to independent retailers, and 17.0 per cent to the hotel, restaurant, and institutional trade (Table 3). Independent retailers are defined here as organizations of three stores or less. The hotel and restaurant classification includes those establishments purchasing processed broilers for resale on their premises in a prepared form. Institutional buyers include governmental agencies, the armed forces, and other public and private institutions.

Eighteen processing plants made almost all sales directly to their outlets. The other five plants sold the majority of their output through some type of company-owned sales office or branch. Hauling to the buyer's premises is done almost entirely by the processor's truck. Relatively few processed broilers move through independent wholesalers, as this function is generally a part of the processor's operations. Small processors typically retail their products directly from the plant (Table 3).

Two developments have affected the distribution of California processed broilers--the rapid expansion of supermarket merchandising methods and the

A function performed by many of the California firms interviewed, in addition to processing and sale of processed products, is wholesale distribution of poultry products purchased from other processors. The principal products handled this way are turkeys, which frequently from cut-up-type production among the processors at these places, usually within the state. Having this, certain of the plants included in the study, engaged in this type of business during 1[illegible]. For five of these companies, this wholesaling function was the main part of their business; one of these processed about 30,000 lbs I buttlers per week, the others about 12,000 or less local birds per week. For the firms, it represented about half their business, and for three firms it was only a minor activities. Two firms were units of national organizations which maintained separate sales divisions to sell products processed by all of the firm's plants. The remaining nine firms operated single plants and sold only the products processed in these plants.

Only one firm included in the study was directly engaged in feed manufacture and distribution; however, one other was part of a company with a separate feed manufacturing division. Two processors operated hatcheries and two were each of which hatch on their own farms. One firm operated as a power-cooperative in the production of broilers.

Distribution of Processed Products

In 1[illegible], California processors distributed and 1[illegible] per cent of their poultry-whole frozen to retail chain, 29.6 per cent to independent retailers, and 1[illegible] per cent to the hotel, restaurant, and institutional trade (Table 1). The dependent retailers are defined here as organizations of three stores or less. The hotel and restaurant classification includes those establishments customarily processed products for resale on their premises in a prepared form. The institutional trade include governmental agencies, the armed forces, and other public and private institutions.

Eighteen processing firms made almost all sales directly to retail outlets. The other five plants sold the majority of their output through some type of intermediary sales office or broker. Selling to the buyer's produce is done almost entirely by the processor's truck. Relatively few processed products are handled through independent distributors, as this function is generally a part of the processor's operation. Most processors typically retail their products directly from the plant (Table 3).

The developments that affected the distribution of California processed poultry--the rapid expansion of supermarket merchandising methods and the

TABLE 2

Size and Location of Plants and Functions[a] of Broiler Processing Firms Included in the Study, California, 1957

Plant	Size of plant: normal weekly number of broilers processed	Location			Functions of firm operating plant					
		San Francisco Bay area	Los Angeles metropolitan area	San Joaquin Valley	Wholesales products processed elsewhere	Operates retail outlets	Manufactures feed	Operates hatchery	Grows own broilers	Operates as grower-contractor
1	Less than 10,000			X		X			X	
2	Less than 10,000	X			X					
3	Less than 10,000	X			X					
4	Less than 10,000		X		X					
5	10,000-14,999		X		X	X				
6	10,000-14,999		X							
7	10,000-14,999	X				X			X	
8	10,000-14,999		X		X					
9	10,000-14,999	X			X	X				
10	10,000-14,999	X								
11	10,000-14,999	X			X	X				
12	15,000-29,999	X								
13	15,000-29,999			X						
14	15,000-29,999		X		X					
15	15,000-29,999		X				X	X		X
16	30,000 or more		X		X					
17	30,000 or more			X						
18	30,000 or more	X			X					
19	30,000 or more	X			X	X				
20	30,000 or more			X						
21	30,000 or more			X	X		X	X		
22	30,000 or more		X		X					
23	30,000 or more			X	X					
Total		9	8	6	14	6	2	2	2	1

a/ In addition to processing and sale of own products.

[illegible]

[illegible]

| [illegible] | [illegible] | [illegible] |

TABLE 3

Size, Location, Principal Method of Sale, and Percentage Distribution of Types of Sales Outlets of Broiler Processing Plants Included in the Study, California, 1957

Plant	Size of plant: normal weekly number of broilers processed	Location: San Francisco Bay area	Location: Los Angeles metropolitan area	Location: San Joaquin Valley	Principal method of sale: Direct from plant	Principal method of sale: Company sales office	Percentage distribution to types of sales outlets: Total	Retail chains[a]	Independent retailers[b]	Hotel, restaurant, and institutional trade	Independent wholesalers
							per cent of sales volume				
1	Less than 10,000			X	X		100		100		
2	Less than 10,000	X			X		100	5	55	40	
3	Less than 10,000	X			X		100	5	10	85	
4	Less than 10,000		X		X		100		50		50
5	10,000-14,999		X		X		100		50		50
6	10,000-14,999		X		X		100		50		50
7	10,000-14,999	X			X		100		90	10	
8	10,000-14,999		X		X		100	20	60	20	
9	10,000-14,999	X			X		100		95	5	
10	10,000-14,999	X			X		100		90	10	
11	10,000-14,999	X			X		100		35	65	
12	15,000-29,999	X			X		100	50	50		
13	15,000-29,999			X	X		100	80	20		
14	15,000-29,999		X			X	100	75	25		
15	15,000-29,999		X			X	100	90	10		
16	30,000 or more		X		X		100	90	5	5	
17	30,000 or more			X	X		100	50	50		
18	30,000 or more	X				X	100	60	20	20	
19	30,000 or more	X			X		100	5	45	50	
20	30,000 or more			X	X		100	75	20	5	
21	30,000 or more			X		X	100	50	40	10	
22	30,000 or more		X		X		100	50		50	
23	30,000 or more			X		X	100	75	20	5	
Total		9	8	6	18	5	100	51.7	29.6	17.0	1.7

a/ Operate four or more retail stores.

b/ Operate fewer than four retail stores.

TABLE 2

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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increasing volume of ice-packed broilers shipped in from other states. The structural changes within the food industry have resulted in an increasing share of volume going to fewer, larger retail outlets. Chain organizations have expanded and independents have joined together under cooperative or voluntary wholesale buying groups in order to gain the advantages of centralized buying.

In 1957, United States supermarkets, stores with annual sales of over $375,000, made 67 per cent of total grocery and combination food store sales, compared with 43 per cent in 1952.[1] These stores aim for at least $30,000 in weekly sales, and almost half of them gross more than $50,000 per week. Seven Los Angeles-area chains had average weekly sales per store ranging from $26,882 to $67,298 in 1958.[2]

Twenty years ago, stores averaged 1,200 square feet in size, and they handled about 1,000 items, compared with an average of about 15,000 square feet and over 5,000 items today.[3] The buying and merchandising practices of these retailers place increased emphasis on specification buying and the need for large volumes of broilers of uniform quality and weight. Self-service merchandising and high-volume turnover require products with proper specifications to be readily available in continuous supply.

The increasing availability of out-of-state birds generally possessing the attributes desired by retailers and priced competitively with the California product has had a significant impact on the California industry. The volume of processed broilers brought into California markets from other states, predominantly Alabama, Arkansas, Georgia, Mississippi, and Texas, is indicated by receipt of figures compiled by the Federal-State Market News Service. These show that recorded receipts of processed poultry (which is almost entirely ice-packed, eviscerated broilers) from out-of-state points at Los Angeles and San Francisco rose from 22,852,000 pounds in 1953 to 85,343,000 pounds in 1957 (Table 4). These figures are not complete due to the impracticability of contacting all receivers; however, they indicate the large increase during these five years, especially in Los Angeles.

1/ The Progressive Grocer, Facts in Grocery Distribution (New York, 1958). p. 7.

2/ "The Big Challenge in Food Marketing", This Week Magazine, 8th Biennial Grocery Study (New York, 1959), p. 72.

3/ N. R. Collins and John A. Jamison, "Mass Merchandising and the Agricultural Producer", The Journal of Marketing, vol. 22, no. 4, April, 1958, p. 358.

[illegible] of volume in independent grocers shipped in from other states. The [illegible] of volume in the food business has resulted in an increasing share of volume going to fewer, larger retail outlets. Chain supermarkets now exceed [illegible] and independents have, instead, joined under cooperative or voluntary [illegible] buying groups in order to gain the advantages of wholesale buying.

In 1977, Safeway, Inc., operated stores with annual sales of [illegible] $40,000,000 made 1.7 per cent of total grocery and combination food store sales, compared with 1.5 per cent in 1972.[1] These stores sold for an least $[illegible] in weekly sales, and almost half of them sales more than $[illegible] per week. Gross [illegible] sales per store averaged nearly sales per store ranging from $[illegible] in 1972 to $[illegible] in 1977.[2]

Safeway stores ranged average 1,[illegible] square feet in size, and they [illegible] about 1,000 items, compared with an average of about 7,000 square feet and over 1,000 items in 1972.[3] The buying and merchandising functions of these [illegible] chains increased specialization by specialized buyers and the use of large volumes of uniform quality and weight. Self-service merchandising and high-volume business results produce with proper specialization to be [illegible] realizing in efficiency gains.

The growth and profitability of out-of-state chains [illegible] [illegible] chains located in California and point largely with the California [illegible] [illegible] and a [illegible] based on the California economy. The volume of [illegible] in California, unlike California markets from other states, primarily [illegible] Alabama, Arkansas, Georgia, Mississippi, and Texas, is indicated by re[illegible] of figures supplied by the California-Nevada Market News Service. These also [illegible] of processed poultry (which is almost entirely low-boned, [illegible] broilers) from out-of-state points at Los Angeles and San Francisco [illegible] from 26,[illegible] pounds in 1973 to [illegible],294,000 pounds in 1977 (Table 4). These figures are not complete due to the impermissibility of conducting all [illegible] however, they indicate the large increases during these five years, especially in the [illegible].

1/ The Progressive Grocer. Food Distribution (New York, 1978).

2/ "The Big Business in Food Marketing". Table [illegible] Food Marketing (New York, 1978), p. 72.

3/ R. E. Collins and John [illegible], Jr., ed., "Food Merchandising and the Consumer", The Journal of Marketing, vol. 22, no. 4, April, 1978, p. 394.

TABLE 4

Receipts of Processed Poultry from Other States at Los Angeles and San Francisco, California, 1953-1957

Year	Total	Los Angeles	San Francisco
	thousand pounds		
1953	22,852	13,179	9,673
1954	22,270	15,401	6,869
1955	26,705	18,842	7,863
1956	71,373	51,793	19,580
1957	85,343	69,390	15,953

Source: Federal-State Market News Service, Monthly Origin of Receipts at San Francisco (San Francisco, 1953-1957). (Includes Los Angeles receipt figures.)

TABLE

Number of [illegible] Factory Workers [illegible] Under [illegible] in Manufacture and Sale of [illegible], [illegible], 1920–1927

Year	[illegible]	[illegible]	[illegible]
	Number of workers		
1920	[illegible]	[illegible]	[illegible]
1921	[illegible]	[illegible]	[illegible]
1922	[illegible]	[illegible]	[illegible]
1923	[illegible]	[illegible]	[illegible]
1924	[illegible]	[illegible]	[illegible]

Source: [illegible] Factory Inspectorate, [illegible] Division of Statistics, [illegible] [illegible] (Dublin: [illegible]).

Since complete data on tonnage of inshipped poultry are not available, an attempt was made in this study to estimate the volume of inshipped broilers using available California production statistics and national and regional per-capita consumption estimates. From this information, it is estimated that in 1957 California consumed between 104,500,000 and 116,200,000 broilers, of which about 43,500,000 were produced within the state. This would indicate inshipments of between 61,000,000 and 72,700,000 birds, or from 58.4 to 62.6 per cent of the total requirements (Appendix B).

Large-scale processing operations in the southern states mentioned above provide ready supplies of processed broilers in volumes required by mass-merchandising retailers. Large-scale retailers in California purchase most of their supplies from these out-of-state sources. Local processors are generally too small to furnish adequate quantities for these retailers' needs. For example, one major northern California chain with annual sales approximately equal to many of the larger Los Angeles chains uses about 200,000 broilers for a week-end special. Processor volume information obtained in this study shows that such an order would require the total weekly output of the three largest California processors (Table 3).

Of the California processors studied, those handling less than 30,000 broilers per week served primarily the smaller retailers and the hotel, restaurant, and institutional trade, although those handling over 15,000 birds per week sold to the larger retailers on a "fill in" basis when those retailers wished to supplement their larger purchases from other states. The largest processors, those handling 30,000 or more birds per week, looked to the large-scale retailer as a principal outlet (Table 3).1/

1/ Processor sales patterns also vary by location. Information obtained from processors interviewed in each area indicates the following percentage distribution:

Processor location	Total	Retail chains	Independent retailers	Hotels, restaurants, institutional buyers	Wholesalers
	per cent of sales				
San Francisco Bay area	100	20.1	50.0	29.9	
Los Angeles metropolitan area	100	59.4	14.5	20.6	5.5
San Joaquin Valley	100	65.0	28.2	6.8	

Since complete data on average of hardwood veneer are not available, an attempt was made to use data which to estimate the volume of hardwood veneer logs available California production statistics and national and regional data on veneer consumption were used. From this information, it is evident that in 1967 California received between 100,000,000 and 110,000,000 veneer, of which about 4,000,000 were received within the state. This would indicate veneer made of between 2,000,000 and 10,000,000 board feet, or from 2% to 9% of the total volume of hardwood logs.

Incomplete information from the southern states reflected very significant regions of processed veneer logs in volume regularly by mere manufacturing was not. Incomplete information in California indicates most of these veneer logs come from other states. Local processors are generally too small to provide adequate quantities for these veneer mill. Our conclusion, that large veneer mills California which are a major source of demand for veneer logs, receive 200,000,000 feet of veneer logs annually. Processor mills information obtained in the field indicate that in order to supply the total veneer output of the three largest California producers requires (Table 3).

In the California processors studied, those handling less than 10,000,000 feet per year annual volume of the veneer production was the total, however, and hardwood, and hardwood veneer, although these handling over 10,000,000 feet annually in the larger veneer mills at a 90/10 log yield, the total volume of veneer logs handled in California large, processors from other states. The large processors, those handling 50,000,000 or more feet per year, lumped in the information mentioned a national outlook (Table 3).[1]

[1] Information below pertains this only by location. Information obtained from processors interviewed in each area indicates the following percentage distribution:

Processor location	Total volume	Total log volume	Total veneer volume	Total veneer volume
	Percent			
Pacific Northwest	100	23.3	5.4	77.6
Gulf States and Eastern states	3	33.8	11.6	20.1	1.
California	100	7.0	9.8	[illegible]

III. Relationship of California Broiler Processors To Their Suppliers of Live Birds

Many activities are carried on to supply broilers in their processed form to the final consumer. The responsibility for performing these tasks is dispersed over a number of different types of firms. In accomplishing the various production, processing, and distribution activities, the usual economic choice problems exist in selecting among alternative resource combinations. When, as is usually the case, the selection of procedures for one set of activities (such as those associated with processing) is related to the manner in which another set of activities (such as farm production) is carried on, the decision-making mechanism must allow for consideration of these interrelationships.

Coordination of several activities can be less complicated if the decision-making responsibility is vested in one body. In this case, the choice of a set of specific actions will be made following an evaluation of expected outcomes of alternative courses with respect to the objectives of the (one) decision-making entity concerned. In actual practice, however, the many interrelated activities are not made the responsibility of one decision-making body; instead, they are divided among different firms. But the outcome of certain of these actions, even though the responsibility of a single firm, may very well affect the income positions of others.

There may be, for instance, a decision unit associated with each farm, processing, and retail firm. Interdependence among actions performed by separate firm units often prevails, just as actions performed within a firm unit can be expected to be interrelated. In the latter case, reconciliation of competitive and complementary relationships among activities is conceptually simple since only one set of criteria exists for evaluating the alternative courses of action. In the former instance, however, a much more complicated situation exists since a choice of actions made by considering the goals of one decision-making unit may not be satisfactory to another managerial unit employing what are probably sharply conflicting criteria.

Some examples will perhaps aid in clarifying this point. Consider an individual farm firm which produces both alfalfa and grain. A complementary relationship exists since soil fertility is increased following the production of alfalfa. A competitive relationship also is present--for example, increasing the acreage used for alfalfa reduces that available for grains. The interaction of these two production activities may be effectively considered by the manager of the farm, the decision unit, with relation to the particular goal of this

III. [illegible]

[illegible]

economic endeavor, say, maximizing the net income from the entire farm operation. For here the farm manager must coordinate the grain and alfalfa production activities in such a way that the combined result is the best. Reconciliation of competitive and complementary relationships is facilitated in this case since alternative resource allocations are judged with respect to only one set of goal criteria.

Consider, alternatively, the case of broiler production and broiler processing. In California, these activities are customarily carried on within separate firms and, therefore, at least two decision-making units are involved. Just as between grains and alfalfa, the production functions of broiler production and processing are interrelated. That is to say, the output expected from a given expenditure of inputs in broiler processing is dependent upon the way broiler production has been carried on. For example, the actions taken on the farm to insure uniformity of quality affect the amount of labor needed in the processing plant to prepare any given grade of product. Although there is just as much reason to coordinate broiler production and processing activities as there is in the case of alfalfa and grains, the problem is more complex because a single firm's economic goals alone cannot be used as a basis for deciding between alternative methods of combining production and processing activities.

This study focuses on those activities carried on by the broiler processor or the live-bird supplier which, through their effect on either the live bird's product characteristics or price, influence the economic welfare of the other. These activities are considered for analytical purposes under three headings: (1) quality of live birds, (2) volume and timing of placements and deliveries, and (3) price. Each of these can be termed a joint decision area as defined in the introduction. The word "area" is used to convey the notion that a number of alternative actions are possible in performing the required tasks. Since this is the case, a decision or choice problem exists. The selection of a particular action implies that some single criterion is available to judge alternatives or that there is some mechanism for reconciling the conflicting goals of the two or more parties involved.

The framework for the existing degree of coordination in the processor-supplier relationship consists of the interfirm arrangements being used. The nature and extent of these arrangements at the time of this study is discussed in the succeeding section. The balance of the report considers the factors which bear upon decision making in the three decision areas mentioned above.

economic endeavor, say, maximizing the net income from the entire farm operation. For these the farm acreage and complexity the guess and also the production activities in such a way that the desired result in the farm. Specialization of enterprises and commercial relationships are factors which in this case also alternative resources allocation are judged with respect to only one set of goal criteria.

Consider, alternatively, the case of broiler production and similar operations. In all cases, these activities are vertically related as might indicate times and, therefore, of least the distinction-making with are involved that as between farms and elsewhere, the production functions of broiler production and processing are interrelated. That is to say, the output-elasticity of a given amount of input in broiler processing is dependent upon the amount of broiler production has been carried on. For example, the end use value of the flow to insure maximum of quality affect the amount of labor needed in the processing plant to process any given quantity of broilers. Although there is just as much reason to consider broiler production and processing activities as one as in the case of alfalfa and grains, the problem is more complex because a single firm may not be willing to be used as a basis for decision-making when alternative methods of production and processing are considered.

The study focuses on those activities carried on by the broiler processor or the live-bird supplier which, through their effect on either the broiler product characteristics or price, influence the economic welfare of the owner. These activities are considered for analytical purposes under three conditions: (1) quality of live birds, (2) volume and timing of placements and delivery, and (3) price. Each of these can be treated a point decision area as defined in the introduction. The word "area" is used to convey the notion that a number of alternative actions are possible in performing the required tasks. There is the case, a decision or choice problem exists. The selection of a particular action implies that some single criterion is available on which action given on that there is some merit for reconciling the conflicting goals of the firm or more generally.

The framework for the analytic phases of coordination in the production and broiler relationship consists of the interview arrangements being used. The nature and extent of these arrangements in the time of this study is discussed in the succeeding section. The balance of the report considers the factors which have been found relevant in the three decision areas mentioned.

Interfirm Arrangements

The California processors studied purchase live birds from three principal sources: growers, grower-contractors, and live-poultry buyers. The grower-contractor classification, as used here, refers to those firms providing grower financing under the terms of a formal, written contract which includes the assumption of major managerial responsibility by the contractor and which guarantees some minimum return to the producer for birds marketed.

Many input suppliers do not offer grower contracts specifying guaranteed minimum prices and, therefore, are not grower-contractors as defined here; however, these suppliers may provide growers with short-term financing. They usually require a chattel mortgage on the chicks, but the degree of direct interest or responsibility in supervising the growing operation is not as great as that of the grower-contracting firm. Most birds purchased by processors directly from growers are financed under these types of arrangements but, although the processor negotiates primarily with the grower, there is considerable knowledge and guidance of sales by the financing supplier.

The live-poultry buyer, or "huckster," generally buys broilers at the farm and resells them to the processor. Included in his service is hauling to the processing plant. There are many variations in the arrangements between these buyers and their processor customers. Most of them have long-standing relationships with the growers from whom they buy and the processors to whom they sell. Some of these buyers function almost as a procurement department for the processor. Most of the processors using a particular live-poultry buyer as their principal source of supply indicated that procurement details were left largely up to him.

Of the processors included in this study, 14 purchased at least a part of their supplies directly from growers, 8 from live-poultry buyers, and 9 from grower-contractors. Purchases from these sources were usually under the terms of some type of continuing relationship, either formal or informal. In terms of total number of birds, 51.3 per cent were purchased through grower-contractors; 32.7 per cent directly from growers, including those cases where financing suppliers had less than complete marketing control; and 12.1 per cent from live-poultry buyers. About 3.4 per cent of the birds were purchased when they were ready for processing from sources with which the processor had no continuing relationship. The majority of these purchases were from growers or live-poultry buyers with marketable birds available. The remainder, less than 1 per cent, were grown on the processors' own farms (Table 5).

Marketing Arrangements

The individual producers studied purchase live birds directly from independent growers, grower-contractors, and live-poultry dealers. The grower-contractors classification, as used here, refers to those firms providing grower financing under the terms of a formal, written contract which indicates assumption of major management responsibility by the contractor and at least some risk to the producer for birds produced.

Many small suppliers do not offer grower contracts specifying guaranteed minimum prices and, therefore, are not grower-contractors as defined here; however, these suppliers are usually growers with short-term financing. They usually receive a certain amount of control over the chicks, but the degree of direct involvement or responsibility in supervising the growing operation is not as great as that of the grower-contracting firm. Most birds purchased by processors directly from growers are financed under these types of arrangements. Although the processor independent primarily with the grower, there is considerable knowledge and guidance of sales by the financing supplier.

The live-poultry buyer, or "dealer," primarily buys broilers at the farm and resells them to the processor. Included in his service is handling to the processing plant. There are many variations in the arrangements between buyers and their processor customers. Most of them have long-standing relationships with the processor from whom they buy and the processors to whom they sell. Some of these buyers function almost as a processing department for the processor. Most of the processors using a particular live-poultry buyer on their payroll. Some of the processors using a particular live-poultry buyer on their payroll indicate that processors' contacts were left largely up to him.

Of the processors included in this study, 11 purchased at least a part of their supplies directly from growers, 6 from live-poultry buyers, and 2 from grower-contractors. Purchases from these sources were usually under the terms of some type of continuing relationship, either formal or informal. The bulk of total broiler of birds, 51.4 per cent, were purchased through grower-contractors; 34.7 per cent directly from growers, including three cases where firms buying live-poultry buyers. About 13.8 per cent of the birds were purchased from live-poultry buyers. The majority of these purchases were from growers or live-poultry buyers with marketable birds available. The remainder, less than 1 per cent, were grown on the processors' own farms (Table 3).

TABLE 5

Number of Broilers Purchased by Broiler Processors Included in the Study by Purchasing Method and Source of Supply of Live Birds, California, 1957

Source of supply	Weekly total		Number of broilers purchased per week by specified methods					
				Informal agreements				
	Number	Per cent	Formal contract	Total	Booking	Continuous arrangement	Noncontinuous relationship	Own flock
Grower (direct)	184,400	32.7	100,000	84,400	84,400			
Feed supplier[a]	273,000	48.4	90,000	183,000	183,000			
Hatchery[a]	16,500	2.9	10,000	6,500	6,500			
Live-poultry buyer	68,100	12.1		68,100		68,100		
Noncontinuous relationship	19,000	3.4					19,000	
Own flock	3,000	.5						3,000
Total	564,000	100.0	200,000	342,000	273,900	68,100	19,000	3,000
	per cent distribution							
	100.0		35.4	60.7	48.6	12.1	3.4	.5

a/ Grower-contractors.

[illegible] Estimated [illegible] Production by Method and Source of Live Stock, California: [illegible]

Item	Number	Per cent	Weight	Total	Average	Number	Per cent	Total
	Number of animals			Weight		Value		
	Number	Per cent	Pounds	Pounds	Dollars	Dollars	Per cent	Dollars
	Slaughtered					Sold alive		
Beef (total)	184,400	37.7	400,000	84,400	8.00			
Veal (total)1/	271,000	54.4	37,000	100,000	60.00			
Mutton1/	10,300	2.1	10,000	6,300	6.300			
Lamb-poultry farm	6,000	1.2		60,100		63,100		
Horse-farm slaughter	10,000	2.0						2,000
Dog flesh	2,000	.4						1,000
Total	489,000	100.0	20,000	[illegible]	[illegible]	63,100	10,000	3,000
	Not included in slaughter							
Total			30,000	50,000	[illegible]	[illegible]	[illegible]	[illegible]

1/ Milk-fed animals.

For the purposes of this study, the various existing arrangements between processors and their sources of live broilers are classified as formal contract, informal agreements, noncontinuous relationships, and ownership. Formal contractual relationships are those in which the specifications are written into a legal contract and signed by both parties. The informal type of arrangement has many shadings in practice; it is defined here as any relationship which is based on a verbal understanding and which both parties look upon, in practice, as a binding agreement within the limits of the understood specifications. This broad area of informal relationships is difficult to define in explicit terms, but its important characteristics will be considered below. The third general classification--noncontinuous relationship--is used here to describe that method of procurement under which purchases are made at or near time of processing from whatever source of supply has birds available. Direct ownership refers to processing firms owning the producing farm and equipment.

Of the processors interviewed, seven used some type of formal contract with at least some of their suppliers. Twenty had informal agreements with some of them. Two firms obtained part of their requirements from sources with which they had no continuing agreement, and two processors filled part of their needs from wholly-owned production operations (Table 6). Normal output figures indicate that, of the birds processed by these firms during 1957, 35.4 per cent were obtained under formal contract; 60.7 per cent through informal agreements; 3.4 per cent purchased under conditions of noncontinuous relationships; and .5 per cent from the firm's own growing operations.

Formal Contracts.--The primary feature of formal, written contracts used by processors surveyed was the method of determining the price to be paid on the day the birds were delivered. This method varied in practically all contracts, not only among processors but also among types of suppliers and even individuals dealt with by a single firm (Table 7). Price provisions included a minimum guarantee per pound live weight. When the market price was higher than this minimum, various methods of adjusting to this price were used. Usually, some fixed relationship between the price paid and a particular market quotation was stated in the contract. This may be the high figure of the market price range listed daily by the Federal-State Market News Service in Los Angeles, San Francisco, or Fresno. It may be the middle-range price or it may bear a definite relationship to this price, such as 1 cent below or above the listed price.

Most formal contracts called for Grade A quality birds. This meant U. S. Grade A except in cases where plants were not under federal grading. In these instances, the term Grade A or Number One was used, but decisions as to the

In the purposes of this study, the various marketing arrangements between producers and their agents of some products are classified as direct, indirect, informal, [illegible], [illegible], and [illegible]. Each of these [illegible] and relationships are those in which the producers are within the [illegible] and [illegible] and [illegible] problem. The informal [illegible] of arrangement [illegible] in production is [illegible] any relationship [illegible] [illegible] [illegible]

TABLE 6

Relative Importance of Various Purchasing Methods Used by Broiler Processors Included in the Study, by Size of Plant, California, 1957

Size of plant: normal weekly number of broilers processed	Total		Formal contract		Informal agreement						Noncontinuous relationship		Own flock	
					Total		Booking[a]		Continuous arrangement					
	Number of plants	Volume of birds	Number of plants	Volume of birds	Number of plants	Volume of birds	Number of plants	Volume of birds	Number of plants	Volume of birds	Number of plants	Volume of birds	Number of plants	Volume of birds
		per cent		per cent		per cent		per cent		per cent		per cent		per cent
Less than 10,000	4	100.0	0	0	4	91.7	4	51.7	2	40.0	0	0	1	8.3
10,100-14,999	7	100.0	0	0	8	98.0	5	45.5	4	52.5	0	0	1	2.0
15,000-29,999	4	100.0	2	58.8	2	25.9	1	8.3	1	17.6	1	15.3	0	0
30,000 or more	8	100.0	5	39.0	6	59.5	6	57.9	1	1.6	1	1.5	0	0
Total	23	100.0	7	35.4	20	60.7	16	48.6	8	12.1	2	3.4	2	0.5

a/ See page 24.

Table 6

Business improvement of farmers in selected areas by income level, 1970-71
Incidence on the group, by source of income, particularly [illegible]

Income of farmers by income level of business improvement [illegible]	Farmers [illegible]																							
	Farmers [illegible]				Farmers [illegible]				Farmers [illegible]				Farmers [illegible]				Farmers [illegible]				Farmers [illegible]			
	Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]		Farmers [illegible]	
	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
Less than [illegible]	4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

a/ See page [illegible].

TABLE 7

Number of Broiler Processors Included in the Study Who Use Guaranteed Minimum Price and Methods of Determining Final Grower Price, by Size of Plant, California, 1957

Size of plant: normal weekly number of broilers processed	Total number of plants	Plants using specified type of final grower price:				Plants using guaranteed minimum price
		Fixed differential from Market-News price	Combination of guaranteed minimum and fixed differential	Processor daily price	Appropriate Market-News price	
Less than 10,000	4	2	0	0	2	0
10,000-14,999	7	5	0	0	2	0
15,000-29,999	4	1	1	1	1	2
30,000 or more	8	0	5	3	0	5
Total	23	8	6	4	5	7

Table 1

Number of Boiler Processes Included in the Study, the Life Cycle Energy Inputs and Models of Intermediate Fuel Power Plants, by Size of Plant, California, 1976

Size of plant normal annual output of boilers (megawatts)	Total number of boiler processes	Life cycle energy inputs (billion Btu)				
		Times [illegible] from boiler - [illegible]	Energy required for [illegible] and fuel delivery (billion Btu)	Energy required for boiler [illegible]	Energy required for [illegible]	Total energy requirement (billion Btu)
Less than 10,000	7	0	0	0	0	0
10,000-19,999	7	0	0	0	0	0
20,000-29,999	3	1	1	1	1	3
30,000 or more	8	0	2	1	2	5
Total	25	1	3	2	3	7

requirements of the grade were determined to the mutual satisfaction of the processor and the live-bird supplier. About 70 per cent of the volume purchased under formal contracts by processors surveyed was handled by processors using the federal grading service. In these cases, grade allowances indicated a percentage limit on Grade B and Grade C birds.

All contracts called for excessive culls to be charged against the supplier. These culls were designated by the federal inspector, where used, or by the processor's inspectors in other cases. Firms using federal inspectors and/or graders indicated that their decisions as to grades and culls provided an objective method of determining quality of birds purchased, and thus avoided additional negotiation with suppliers.

Weight specifications in written contracts varied from specific minimums or ranges to approximate average weights to general statements that weights be acceptable to the processor. Processors using these contracts indicated that relationships with suppliers were such that weight requirements were usually worked out to mutual satisfaction, with or without specific mention in the contract.

Most formal contracts stipulated that the supplier furnish some stated number of birds per week or other specified period. Other provisions concerned method of delivery and renewal or cancellation procedures.

In general, formal written contracts did not provide for any direct grower supervision by the processor. Processors believed that contract enforcement was largely a matter of mutually satisfactory working arrangements rather than strict tolerances and penalties. Variations from contract provisions were usually worked out through informal negotiation between the parties.

Formal contracting with growers or grower-contractors was much more common in the Los Angeles area than in either of the other two areas of California. However, at the time of this study, several processors in the San Francisco and San Joaquin areas had recently entered into written contracts with growers for the first time.

Informal Agreements.--As indicated by the volume figures (Table 5), most of the birds purchased by California broiler processors interviewed were obtained within the framework of some type of informal relationship between the processor and his sources of supply. Within this classification of relationships, there were two principal procurement procedures, the "booking" system and the continuous arrangement with a live-poultry buyer.

requirements of the grade were determined to the mutual satisfaction of the processor and the live-bird supplier. About 10 per cent of the volume purchased under formal contracts by processors surveyed was handled by processors using the Federal grading service. In these cases, grade differences indicated a premium [illegible] of Grade A and Grade B birds.

All contracts called for extensive calls to be exercised against the supplier. Large pools were inspected by the Federal inspectors, as in the processor's inspection in other cases. Plants using Federal inspection and/or graders indicated that their decisions as to grades and costs provided an objective method of determining quality of birds purchased, and thus avoided additional complaints on both sides.

Weight specifications in written contracts varied from specific maximum or ranges to approximate average weights or general statements that weights be acceptable to the processor. Processors using these contracts indicated that relationships with suppliers were such that weight requirements were generally worked out to mutual satisfaction, with or without specific mention in the contract.

Most formal contracts stipulated that the supplier furnish some stated number of birds per week or other specified period. Other provisions concerned method of delivery and payment or cancellation procedure.

In general, formal written contracts did not provide for any direct grower supervision by the processor. Processors believed that contract enforcement would require a system of mutually satisfactory working arrangements rather than strict adherence and penalties. The details of the contract provisions were usually worked out through informal negotiation between the parties.

Formal contracting with growers or grower-processors was less common in the Los Angeles area than in either of the other two areas of California. However, at the time of this study, several processors in the San Francisco and San Joaquin areas had recently entered into written contracts with growers for the first time.

Informal Agreements.--As indicated by the volume figures (Table 5), most of the birds purchased by California broiler processors interviewed were obtained within the framework of some type of informal relationship between the processor and his sources of supply. Within this classification of relationships, there were two principal procurement procedures, the "[illegible]" system and the purchase arrangement with a live-poultry buyer.

Three of the larger volume processors obtained all their supplies through an advance "booking" system without a formal contract. Under this procedure, the supplier "books" birds at the time of placement for future delivery to the processor. Usually, this amounts to a telephone transaction, but this may be followed up by a written notification indicating the exact number of birds involved, time of placement, and the time of expected delivery. This "booking" procedure was most widely used when dealing with grower-contractors responsible for the marketing of birds under contract. In these cases, the name of the particular grower and his location were included in the information concerning the transaction, whether or not written notification was given.

Informal arrangements between processors and individual growers closely resemble the "booking" system in operation and are included in that category (Table 6). Among firms surveyed, this type of direct arrangement with growers usually supplied only a portion of the total processor requirements. These arrangements often had developed over a long period of time and were being maintained even if principal supplies were procured elsewhere.

The other main type of informal agreement was found between the processor and the live-poultry buyer or "huckster." These live-poulty buyers work closely with the processor and maintain constant contact in regard to day-to-day quantities of live birds required. The operating terms of these arrangements are generally well understood by both parties due to long established relationships. In many cases, the live-poultry buyer serves as the principal or sole source of supply of live birds for a number of processors and thus can allocate his supply between them. In this way, it is possible, at least to some extent, to provide for minor variations in bird specifications desired by individual processors, such as particular bird weights.

The specifications involved in these informal relationships are much the same as those included in formal contracts. Generally, mutual satisfaction of the supplier and the processor is the major element contributing to continuity of the relationship. The constant contact and the dependence of each party on the performance of the other facilitate rapid adjustment of any variation from desired specifications. Processors handling at least 30,000 broilers per week, especially those in the San Joaquin Valley, relied heavily upon this method of maintaining sources of supply.

Noncontinuous Relationships.--Few processors obtained supplies of live birds from sources with which they did not have a continuing relationship. These purchases are usually made when birds are ready for market. Historically, when the broiler operation was a relatively minor function compared with other poultry

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Informal arrangements between processors and individual growers closely resemble the "booking" system in operation and are included in that category (table 8). Among firms surveyed, this type of direct arrangement with growers usually supplied only a fraction of the total processor requirements. These arrangements often had developed over a long period of time and were continued even if principal supplies were obtained elsewhere.

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The specifications involved in these informal relationships are much the same as those involved in formal contracts. Generally, mutual satisfaction of the supplier and the processor is the major element contributing to continuation of the relationship. The constant contact and the dependence of each party on the performance of the other facilitate rapid adjustment of any variation from desired specifications. Processors handling at least 10,000 broilers per week, especially those in the San Joaquin Valley, relied heavily upon this method of maintaining sources of supply.

Noncontinuous Relationships.--Some processors obtained supplies of live birds from sources with which they did not have a continuing relationship. These purchases are usually made when birds are ready for market. Historically, when the broiler operation was a relatively minor function compared with other

enterprises, this method of purchase was satisfactory as adequate supplies of birds were usually available at time of need. Today, however, the great majority of live birds are scheduled to go to a particular processor at time of placement or early in the growing period or are sold to a live-poultry buyer who generally has continuing relationships with his processor outlets.

Processor Owned.--Processor owned sources of supply include those cases, such as the two found in this study, where processors produce a portion of their broilers on their own farms. Under these conditions, live-bird production and supervision are carried out directly by the processor. Both processors interviewed who produced a part of their own supplies normally handled fewer than 10,000 broilers per week and in both cases they produced less than half of their requirements. Neither of these firms planned to expand their broiler production operations.

Summary of Procurement Arrangements.--Sources of live birds for the California broiler processing plants studied have changed in the past five years. Generally, the shift has been away from direct purchases from large numbers of growers. Most of the processors interviewed had dealt with individual growers without the intermediary grower-contractor or live-poultry buyer. One major processor had dealt with over 300 growers as late as 1955, but at the time of this study was obtaining all live birds from only 10 sources. Many had continuing arrangements to take the output of particular growers. Others purchased birds at the time of maturity from the best available source, usually an individual grower or live-poultry buyer.

These processors now rely primarily on contractual relationships with growers, formal or informal agreements with grower-contractors, and continuing arrangements with live-poultry buyers. These changes have developed for a number of reasons, some owing to developments within the processing segment itself and some external to it.

Developments outside the processing segment have centered around the trend toward increasing reliance by producers upon the financing and risk-sharing services offered by grower-contractors and financing input suppliers, particularly feed manufacturers. As growers have turned to contract growing or other financial relationships with suppliers, marketing responsibility for their birds has also tended to shift to the financing agency.

Financing agencies have assumed the major responsibility for grower supervision. Processors studied generally do not engage in direct production supervision. If a grower-contractor furnishes financing under contract terms, he also assumes the responsibility for selling the birds. Input suppliers providing

enterprises. This method of purchase was satisfactory, as adequate supplies of birds were usually available at time of need. Today, however, the great majority of live birds are scheduled to go to a particular processor at time of placement or early in the growing period or are sold to a live-poultry buyer who generally has continuing relationships with the processing outlets.

Processor owned.--Processor-owned sources of supply include some farms, such as the two found in this study, where processors produce a portion of their broilers on their own farms. Under these conditions, live-bird procurement and supervision are carried out directly by the processor. Both processors interviewed who produced a part of their own supplies actually handled fewer than 10,000 broilers per week and in both cases they reported that less than half of their requirements. Neither of these firms planned to expand their broiler production operations.

Sources of live birds for processing.--Sources of live birds for the Delmarva broiler processing plants shifted very [illegible] in the last five years. Generally, the shift has been away from direct purchases from large numbers of growers. Most of the processors interviewed had dealt with individual growers without the intermediary grower-contractor or live-poultry buyer. One major processor had dealt with over 300 growers as late as 1955, but at the time of this study was obtaining all live birds from only 10 sources. Many had contracting arrangements to take the output of particular growers. Others purchased birds at the time of maturity from the best available source, usually an individual grower or live-poultry buyer.

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Financing agencies have assumed the major responsibility for product disposition. Processors and dealers generally do not engage in direct production supervision. If a grower-contractor furnishes financing under contract terms, he also assumes the responsibility for selling the birds. Thus, suppliers providing

financing exert varying degrees of influence over live-bird marketing. Usually, sales decisions are made jointly by the grower and the financing supplier.

Managers of the larger processing plants want a continuous flow of quality birds in adequate volume. These firms indicated that they were turning to grower-contractors and financing suppliers as their live-bird source for three principal reasons: (1) These agencies, through their various arrangements with growers, have available large volumes of birds under their marketing control or supervision. (2) The processor can schedule his supplies from these sources by dealing with a few firms rather than with many individuals. (3) Generally, birds grown under financing arrangements of this type are subject to some type of supervision over production equipment used, feeding, and general care if such supervision is deemed necessary. This tends to lead to a more uniform quality of product and lessens or eliminates the necessity for processor field work in observing and coordinating production activities.

Smaller processors included in this study, those handling less than 15,000 broilers per week, do not consider a scheduled supply as important to them as it is to larger processors. They place less emphasis upon utilization of capacity. By purchasing more or less on a last-minute basis, they obtain a flexibility in their production operations which more than offsets advantages that might be gained through advance arrangements with suppliers. In view of these considerations, these smaller processors turn to sources of supply which more closely fit their mode of operation. Most often, this means using the services of a live-poultry buyer.

The services provided by a live-poultry buyer usually include hauling, and this type of supplier is in a position to split larger flocks into small quantities of birds required by many processors. The supply of birds generally available and known to the live-poultry buyer is another factor which enhances the value of his services to these smaller processors as it lessens the necessity for them to maintain constant contact with growers.

The smaller processors interviewed were concentrating their own time and efforts on plant operations, sales, and delivery to customers. These are areas where they can differentiate their services and products from those of large-scale and out-of-state processors. This emphasis, in most cases, has led to the use of sources of live birds which are dependable but which require as little processor expense as possible for supervision or procurement.

The procurement arrangements through which the California broiler processors studied obtain their supplies of live birds vary from ownership to purchase from sources with which no continuous relationship exists whatsoever. However, more

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Smaller processors included in this study, those handling less than 25,000 broilers per week, did not consider a continuous supply as important to them as to a larger processor. They place less emphasis upon utilization of capacity. In purchasing more or less on a day-to-day basis, they retain a flexibility in their production operations which more than offsets advantages they might be gaining through advance arrangements with suppliers. In view of these considerations, these smaller processors tend to purchase mainly those birds which fit their scale of operation. Most often, this means using the services of a live-poultry buyer.

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The procurement arrangements [illegible] of the smaller-sized [illegible] processors required obtaining their supplies of live birds [illegible] from suppliers [illegible] services which at customary distances [illegible] dealers or wholesalers. However, [illegible]

than 95 per cent of the broilers purchased by these processors were obtained under some type of formal contract or informal agreement. Although there is no clear-cut pattern to these procurement arrangements, certain general features are apparent. There is little evidence of formal integration of these processors with their sources of supply. Although formal contracts are used extensively by some of the larger firms, these usually involve extension of processor control over producer actions only in a very limited degree. Decision making as to production facilities and practices, including choice of breeds and feed, is usually left to the supplier rather than specifically spelled out in the contract. This same limited degree of control is also apparent in informal arrangements. Although "bookings" are made only for the length of the growing period in advance of processing, the continuing nature of this type of relationship in practice is much the same as in most of the formal contractual procedures. Processor supervision and control over production practices are relatively minor. Agreement is reached on a certain number of birds of a specified quality, a specific method of price determination, and usually some relation to a specified market price on day of delivery.

Coordination in Specific Areas of Joint Interest

Quality of Live Birds.--Quality specifications are important to the processor for both technical production and marketing reasons. Of the California processors studied, all of those handling 30,000 or more broilers per week specifically pointed out plant operating costs as a major area of concern as competition from inshipped birds increased. Extensive trimming, cutting, and sorting increase costs. The economies of production-line processing require that process flow be interrupted as little as possible.

As increasing amounts of processed broilers are sold through mass-merchandising supermarket outlets designed for high volume and self-service operations, uniformity of quality characteristics is a principal requirement. Price adjustments for off-grade products are of little interest to retailers who have built their sales around a uniform quality item.

The grower also has a direct interest in the quality specifications of the birds produced. Choice of production methods has direct cost implications. Such variables as breed, amount and type of feed, type of litter, medication, physical housing construction, layout, and area per bird all bear on the ultimate quality of product. Breed characteristics affect feed-conversion performance, resistance to disease, and average mortality rate. Fleshing, structure,

[illegible]

[illegible]

[illegible]

meat and feather color, and finish have direct bearing on the marketability of the processed product.

Once a broiler flock has been grown to market weight, rejection of the birds by the processor for quality reasons has cost-increasing implications for both parties. From the processor's standpoint, rejection of a flock that has been scheduled for processing requires a replacement flock of acceptable quality if production flow is to be maintained. Supply of processed broilers for regular outlets may be interrupted. Inplant costs are increased by such delays, and procurement expense may rise due to the necessity of finding alternative sources of supply.

From the producer's standpoint, a processor's decision to reject a flock when it is ready for market immediately results in higher production costs if optimum age and weight have been attained.[1/] Grower production schedules are disrupted while alternate outlets are found for the marketable birds. Additional expense is incurred in attempting to sell the flock to other outlets.

Quality considerations are clearly an area of mutual interest to the processor and his suppliers. Decisions made by one party bear directly upon the profit determinants of the other. The importance to processors of the quality of bird produced would presumably motivate them to influence decisions made at the grower level. California processors studied, however, had not moved into the production of live birds either through ownership or through contractual arrangements, nor had they attempted to exercise supervision over production to any great extent. Among those surveyed, only two of the smaller processors were directly engaged in broiler production, and even these produced only a part of their total requirements.

Theory might suggest the use of payment systems which differentiated prices between grades in order to provide information and incentive for growers to produce specific quality birds. However, the pricing system is not generally used to provide a means of communication between the California processors studied and the grower. None of these processors paid various prices for live

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1/ For a discussion of the determination of optimum marketing timing from the producer's standpoint, see:

R. C. Smith, What Age and Weight to Market Broilers, University of Delaware, Agricultural Extension Service Bul. 66 (Newark, 1955), 6p.

U. S. Department of Agriculture, Economic Choices in Broiler Production, Technical Bul. 1154 (Washington, 1956), 27p.

work and further note, and finish here. Above, leaning on the [illegible] ability of the proposed project.

Once a bay has fished has been given to which weight, a book or of the other by the producer for quality reasons has considerable bearing on the [illegible] [illegible]. Then the producer's standard, relation of a fish that has been [illegible] for processing requires a replacement time of more [illegible] quality of [illegible] time to the market. Supply of [illegible] [illegible] for [illegible] [illegible] [illegible]. Market costs are increased by such delays, and [illegible] [illegible] [illegible] of fish [illegible] [illegible] of work.

[illegible] [illegible] [illegible], a reasonable [illegible] [illegible] [illegible] when it is [illegible] [illegible] [illegible]

birds based on grade of the processed product.[1] A uniform price per pound live weight was paid for the entire flock, and only culls--usually birds grading below U. S. Grade C or its equivalent--were deducted by the processor. Several larger processors using U. S. grades indicated that they expected lots to contain not more than 10 to 15 per cent Grade B and 5 per cent Grade C birds. Growers whose flocks continually include too many lower grades or a relatively high percentage of culls, based on federal or processor inspection, are eventually excluded from acceptance rather than handled on a differentiated price basis.

The feasibility of increasing the degree of integration between grower and processors relating to decisions on live-bird quality can only be judged by taking into consideration the effect of this expanded relationship on coordination in other areas of joint interest. It is doubtful if either party in a joint decision-making relationship would relinquish freedom of action in one area without receiving some compensating adjustment in another. In particular, if the broiler processor were to extend his degree of supervision over bird quality, the grower would expect some additional consideration such as assurance of a market, a price guarantee, or production financing. Under these circumstances, the processor would be forced to include in the expanded relationship values for other variables, such as volume available by time period and bird weights desired at delivery. The processor and grower would also require assurance of mutual compliance with the terms of these arrangements.[2]

The necessity of enlarging the relationship to encompass these numerous additional areas in order to satisfy the quality requirement was mentioned by processors as a strong deterrent to their expansion in this direction. Five of the eight largest processors studied evidenced considerable reluctance to increase the scope of their relationships with growers. In view of the importance of quality and the specifications of the live bird to the processor, it is apparent that actions taken by other segments of the California industry may have a considerable effect upon the degree of grower-processor integration.

1/ For a discussion of the use of grade and yield in pricing live turkeys, see:

U. S. Agricultural Marketing Service, "Gains and Losses in Buying Turkeys On a Live-Price Basis," The Marketing and Transportation Situation (Washington, 1958), pp. 28-32.

2/ Mueller and Collins, "Grower-Processor Integration in Fruit and Vegetable Marketing," Journal of Farm Economics, vol. XXXIX, no. 5, December, 1957, pp. 1480-1481.

price based on grade of the processed product. [illegible] uniform price per pound for eggs was paid for the entire flock, and only quality--usually grade or--low U. S. Grade C or its equivalent--were deducted in the processing. Except large processors using U. S. grades indicated that they preferred lots to contain not more than 10 to 12 per cent Grade C and 5 per cent Grade Inferior.

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1/ For a discussion of the use of grade and grade in pricing live [illegible], see:

U. S. Agricultural Marketing Service, "Prices and Costs in Selling Dressed Broilers in a Live-Bird Market," [illegible] and Marketing Research Report [illegible], pp. 34-42.

[illegible] and [illegible], "Grower-Processor Integration in Fruit and Vegetable Marketing," Journal of Farm Economics, vol. [illegible], no. [illegible], December, [illegible], pp. [illegible].

The position of the grower-contractor and financing input supplier seems to have a direct bearing on processor actions. These firms, particularly the grower-contractor, exert control over production practices of individual broiler growers. Chicks, feed, litter, medication, and other production inputs are generally furnished and production practices are closely supervised by these contractors. Suppliers who furnish varying amounts of production credit without contractual ties also influence growing practices to a lesser extent. In either case, it is clear that these third parties who have considerable influence on production results are closely involved in the grower-processor relationship.

The grower-contractor must be concerned with the decisions made affecting bird quality. He is directly involved in the growing and marketing of the birds. Other financing agencies influencing production practices are also concerned with the profitability of the venture and, therefore, the ready marketability of the live broilers. Some basis for decisions relating to quality must be developed. Processor requirements play a large part in these decisions.

Production practices which determine bird quality can vary widely in their cost, timing, and method of application. Standardization of these variables through concentration of supervision in the hands of a relatively few contracting or financing agencies reduces the variation in growing practices.

Centralized supervision by relatively large grower-contractors makes possible more rapid and effective dissemination of latest production methods, new breeding advances, medication developments, and other input changes. These firms tend quickly to become aware of these technological achievements, and their direct financial interest in the growing operation gives them sufficient control to put these developments into effect. Not only is this line of communication to the producer direct, but the concentration of marketing control in the hands of these relatively few firms tends to ease communication with processors. Processor requirements are well known to grower-contractors and can be transmitted easily to growers through supervisory personnel.

Processors surveyed indicate that firms, such as grower-contractors, with direct financial interest in growing operations have largely taken over the supervision of broiler production. These processors give very little production credit, and this is limited to relatively small advances. They believe that supervision over production--hence, live-bird quality determination--is adequately provided by financing feed companies and other grower-contractors. The state's major processors do not indicate any great degree of conflict of interest with the grower-contractor or financing supplier in regard to broiler

The position of the power-contractor and financing supplier seems to have a direct bearing on processor policies. These firms, particularly the power-contractors, exert a great over production practices of the virtual broiler processors. Little, if any, other medication, and other production inputs are generally furnished and production practices are closely supervised by these contractors. Significantly the further varying amounts of production credit without contractual ties also influence growing practices to a lesser extent. In either case, it is clear that these third parties do have considerable influence on production results are closely involved in the power-processor relationship.

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Contractors supported by relatively large power-contractors make possible more rapid and effective diffusion of improved production methods, new breeding advances, medication developments, and other rural changes. These firms tend quickly to become aware of these technological achievements, and their direct financial interest in the growing operation, give them sufficient control to put these developments into effect. Not only is this line of communication to the producer direct, but the concentration of contracting activity in the hands of these relatively few firms tend to ease communication with processors. Processor requirements are well known to power-contractors and can be transmitted easily to growers through supervisory personnel.

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quality. On the contrary, most of these processors agreed that quality had improved under the influence of these firms. The sensitivity of these supervisory agencies to processor quality requirements seems to obviate the need for increased direct grower-processor coordination.

Eleven of the California processors studied handled less than 15,000 birds per week. Certain characteristics of these firms' operations reduce the need for closer grower relationships. Their sales are primarily direct to consumers or in small lots to independent retailers and a regular hotel and restaurant trade. The plant facilities of these firms are largely geared to hand operations, and flexibility of labor force and work hours permits considerable processor compensation for variation in live-bird quality, volumes, and delivery timing. In addition, customers of these smaller processors are usually small and numerous enough to permit individual selection of bird size and quality from varied lots. The majority of the smaller processors interviewed stated that the disadvantages of variation in delivery weights and quality were partially offset by individual differences in customer specifications; hence, the need for coordination is diminished. Another factor reducing the amount of grower-processor coordination needed is related to the widespread use of live poultry buyers by the state's smaller processors. These buyers generally purchase from a number of individual growers and are in a position to fill the quality requirements of their processor customers by matching the specifications of individual growers' lots to those desired by certain processors.

The processors interviewed who handle from 15,000 to 30,000 birds weekly operate in a similar fashion. Although they usually have more automatic equipment than smaller processors, they have much the same flexibility of labor force and work hours and serve the same types of customers. Hence, the need for active efforts to coordinate supply volume, delivery, and quality is effectively reduced.

Although two of the larger processors obtained the bulk of their supplies from growers under terms of a formal contract, most birds were not procured in that way. Moreover, even where these contracts with growers existed, there was little evidence of direct processor influence on quality-determining decisions and no supervision of producer operations. Those processors using formal contracts with growers, including a minimum price guarantee, apparently did so primarily in an attempt to secure growers generally believed to be the best managers and producers of quality birds. Although the producers to whom contracts were offered were usually financed by an input supplier, the processors dealt directly with the grower and, by guaranteeing a minimum return per pound, were

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Although two of the larger processors obtained the bulk of their [illegible] [illegible] [illegible] of a formal contract, most firms were not [illegible] in [illegible]. However, even where there contracts with processors exists, [illegible] [illegible] relative to the processor quality due to quality-determining [illegible] and to [illegible] of processor specifications. Those processors [illegible] [illegible] with [illegible], including a minimum [illegible] purchase, appear to [illegible] [illegible] to be in an attempt to secure [illegible] believed to be the [illegible] [illegible] and [illegible] of quality [illegible]. Although the [illegible] [illegible] [illegible]

able to obtain their volume requirements from particular growers whom they regarded as most desirable.

Considerations of mutual interest concerning bird quality seem to be sufficient to induce a marked expansion of the grower-processor relationship. However, as long as the functions performed by grower-contractors or other financing agencies remain substantially as they were at the time of this study, there appears to be little incentive for increased grower-processor integration.

Volume and Timing of Placements and Deliveries.--For the individual processor, efficient use of plant facilities, personnel, and distribution organization and maintenance of sales outlets depend upon a satisfactory supply of live birds. Continuity of supply, which depends on proper timing of placements and deliveries, is fundamental to building and maintaining a qualified labor force and a skilled supervisory staff. Establishment of brand names and a record of dependability requires continuous availability of the processor's products.

Today's labor cost characteristics, such as pay for minimum work time and for waiting time, have moved direct labor from the variable cost category toward that of fixed overhead. The larger processors stressed that increased investment in automatic equipment has been necessary. Both of these developments have greatly increased the importance of scheduling the flow of live birds into the processing plant.

Individual bird weights and variation between weights in a lot are assuming increasing importance to large-scale, self-service retail operations. In high-volume retail outlets, particular unit sizes which move most readily under self-service conditions are carefully noted, and these weights, or a narrow range around these weights, are specified by the buyer. Smaller-scale retail outlets also want specific sizes which most closely fill the requirements of their regular customers. Live-bird weights, therefore, are of considerable importance to processors in meeting customer requirements, and these weights are directly related to producer practices.

The grower, too, has a stake in the volume and timing of placements and deliveries, since these affect the proper utilization of his buildings, other equipment, and labor. Because he wishes to minimize costs, he will try to achieve optimum slaughter weights. Disease and mortality risks are proportional to the length of the growing period, as are other hazards such as fire and windstorm. If there is financial pressure on the grower, he will have an incentive to deliver his live birds as early as possible to realize cash income.

Grower-contractors and financing suppliers must add other overhead factors, such as supervisory and accounting services, to these grower considerations. In

addition, production of inputs furnished by these firms, such as feed or chicks, is usually geared to broiler volumes and timing of placements. To keep these input suppliers operating at capacity, the use of broiler production facilities must be carefully synchronized. Continuity of input production requires ready availability of adequate processing outlets for the birds produced.

The process of broiler production and marketing is not confined to the nine-to-twelve-week period during which the chicks are brought to marketable weight. Research, breeding, production of hatching eggs, hatching the broiler chick, growing the chick to maturity, processing, and sale of the processed product require long-term planning and involve many specialized segments of the total industry. Each segment of the industry must view the continuity of operation as a factor closely related to its profit position. Interrelated production capacities, once established, are dependent on maintenance of output volumes at every level. As the "batch" system and larger flocks continue to become more predominant, the flow of inputs becomes much more dependent on a corresponding uninterrupted flow of finished product.

Decisions made in relation to total broiler production in California are functions of many variables such as product and factor prices, alternative uses of available resources, mobility of factors of production, and other economic considerations bearing on the opportunity cost of resources used in broiler growing. Analysis of these issues is not within the scope of this study; however, some factors involved in decisions made as to volume of production are specifically related to processor considerations.

The growing importance of wholesale handling of inshipped birds by many processors means that they are less dependent upon California production. Over 50 per cent of the processors interviewed were handling inshipped broilers in this manner. As long as satisfactory volume and quality of ice-packed broilers are readily available at comparable prices, many processors through their wholesaling operations can fill the requirements of their customers. Large-scale retailers are the principal buyers of these inshipped birds, and since these retailers are becoming the major processor outlets in most areas, processors can meet their demands by handling the inshipped product.

This is not to say that all processors are reducing their processing operations proportionately as they handle increasing volumes of inshipped broilers. Most of the processors studied were processing a volume of California broilers comparable to what they had handled for many years; however, of the 15 plants handling less than 30,000 birds per week, 5 were decreasing processing operations as they increased their distribution of inshipped broilers. Three of these

production production of inputs determined by these lines, as well as feed or other, is usually carried to broiler volumes and binding of placements. To keep these limit supplies operating at capacity, the use of broiler production facilities must be carefully managed. Continuity of input production requires ready availability of adequate processing outlets for the birds produced.

The process of broiler production and marketing is not confined to the three-to-twelve-week period during which the birds are brought to marketable weight. Breeding, production of hatching eggs, hatching the broiler chick, growing the chick to maturity, processing, and sale of the processed product require long-term planning and involve many specialized segments of the broiler industry. Each segment of the industry must view the continuity of operation as a factor closely related to its profit position. Integrated production-processing, once established, are dependent on maintenance of output volumes at a very level. As the "factory" system and larger flocks continue to become more prominent, the flow of inputs becomes much more dependent on a more predetermined flow of finished product.

Decisions made in relation to total broiler production in California are influenced by many variables such as product and factor prices, alternative uses of available resources, mobility of factors of production, and other economic considerations relating to the opportunity costs of resources used in broiler production. Analysis of these issues is not within the scope of this study; however, some factors involved in decisions made as to volume of production are generally related to production considerations.

The rapidly expanding of relatively specialized and integrated plants in many processors areas that they are less dependent upon substantial investment. The 50 per cent of the processors interviewed have limited; mostly in single-purpose operations in large scale. As long as satisfactory volume and quality of non-packed products are readily available at commercial prices, many processors thought their slaughtering operations can fall the requirements of their customers. Large-scale processors are the principal buyers of these dressed birds, and since these processors are been the major processor outlets in most areas, processors must meet their demands in quality of dressed product.

This is not to say that all processors are reducing their processing operations proportionately as their needs increasing volumes of dressed product. Most of the processors interviewed were processing a volume of California broilers considerable in that they are dressed handled for many areas; however, of the 15 processors handling less than 1,000 birds per week, 5 were dressing processing operations as their processed birds distribution of dressed product. These 5 were

had equipment which was becoming obsolete, and they preferred to shift the emphasis of their business rather than replace the equipment. The other two plants did not face this problem, but the management felt that distribution was a more profitable function.

A second factor decreasing processor dependence upon California broiler production is the importance of turkey and fowl processing to many of the firms. Many of the processing firms studied handle a tonnage of turkeys equal to or exceeding their broiler tonnage. Among those processing more than 30,000 broilers per week, three handled more than twice as much turkey tonnage as broilers, and two processed an equal amount of each. Fowl processing provides an alternative use for equipment and labor force and accounts for almost half the volume of some processors.

Another reason for this difference in dependence upon volume production in California is the relatively small size of many local processors. Their volume requirements are such that day-to-day needs are very small and do not have to be planned much in advance of delivery date. Availability of large, stable supplies of live birds is therefore of considerably less importance to these firms than to the larger processors. Most of those handling fewer than 5,000 birds per week are in this category.

The decision as to specific delivery time and weight must consider the overall efficiency of the production and marketing operations rather than production factors alone. About 85 per cent of the broilers handled by processors surveyed, or approximately 53 per cent of total state production, were "booked" for processing when placed in grower houses; hence, an element of dependence of one operation upon the other was immediately introduced. Price fluctuations notwithstanding, marketing considerations are introduced at time of placement under these conditions. The individual flock must be marketed so as to fulfill the supplier's obligation to the processor. Delivery time adjustments which can be made between various flocks sold by a grower-contractor or other financing agency are feasible only within the narrow limits of alternative flock availability and condition.

Delivery weight is a variable that can be measured relatively easily by the grower and the processor as compared with the quality factors. The measurability of this variable is significant in that weights can be readily obtained and adjustments to desired specifications can be made without a continuing grower-processor relationship. The common practice among the larger processors using the "booking" procedure was to send their own fieldman to the farm a few days prior to scheduled delivery dates to check on general appearance and weights attained.

and equipment which was becoming obsolete, and they preferred to wait the expiration of their contracts before replace the equipment. The other two plants did not face this problem, and the management felt that distribution was a more profitable investment.

A second factor determining process or dependence upon milk-fed broiler production is the importance of market and feed processing to many of the firms. Some of the processing firms received fees or a margin of revenue equal to or exceeding the broiler income. Among these processing more than 1,000 broilers per week, these ranged here than more as much as by tonnage as broiler, and two processed as many pounds of feed. Feed processing provides an alternative use for equipment and labor force and accounts for almost half the volume of these processors.

Another reason for this difference in dependence upon milk-fed broiler production is the relatively small size of many local processors. Many of these processors are not with day-to-day needs the very small and to meet these planned much in advance of delivery date. Availability of large supplies of this bird is therefore of considerably less importance to these firms than to the larger processors. Out of seven processing fewer than 1,000 birds per week are in this category.

The decision as to a public delivery time was really most consider the overall efficiency of the operation and considering quantities rather than considering factors alone. About 60 per cent of the firms handled or processes everyone an economical unit of one week of total whole production. Some hoped to be having their plants in proper nonsense order, an element of dependence of production upon the other was increasingly important. Other functions, especially, weekend or overnight slaughter are determined at time of planning their cases conditions. The individual f ock must be marketed so as to fulfill the economic obligation to the producer. Delivery time distribution and the relationship between work and a power-or-freeze or other limiting factors are feasible only within the narrow limits of alternative flock availability and condition.

Delivery method is a variable that can be measured relatively easily in the grower and the processor as may and the quality factors. The importance of this variable is significant in that subjects can be readily obtained and measurable to develop a quantitated and to make without a very accurate processor relationship. The common practice among the larger processors is the "leading" processors are to send their men to the farm a few days prior to scheduled delivery date to check on general appearance and condition.

The attainment of desired bird weights does not seem to possess as many aspects of joint interest which would lead to as high a degree of coordination between the parties as would other, less easily measured variables such as quality. However, three of the larger processors indicated that delivery-weight provisions were specifically included in their agreements with suppliers. In general, live weights averaging about $3\frac{1}{4}$ pounds were preferred. One contract used stated that a certain number of birds be delivered within a range of $2\frac{1}{2}$ to $3\frac{1}{2}$ pounds. Another one specified a minimum of $2\frac{1}{2}$ pounds, with stated tolerance, and another called for an average weight of $3\frac{1}{4}$ pounds.

Among the processors surveyed, those who do not generally include some weight provision in agreements with suppliers--contractual or otherwise--are more concerned with the timing of the birds into the plant than with specific weights attained. Two of the larger processors said that at the time the birds are "booked," delivery is scheduled on a certain day, such as nine weeks and three days after chick placement. However, the practice of inspecting the flock immediately prior to scheduled delivery was also followed in these cases.

The fact that grower-contractors and financing suppliers have become major decision-making units in relation to production volume and practices has a distinct bearing on processor activities in this area. These financing agencies have combined many growing operations under centralized control and have worked closely with processors in order to be assured of adequate outlets. This close relationship makes it possible for the processor to keep fully informed of volume and timing of placements and for the financing or contracting agency to be continuously aware of processor requirements. As long as the interest of these agencies in maintaining a stable supply of California broilers remains high, there is little incentive for processors to form closer relationships with producers.

Price.--As has been pointed out in the introduction to this study, price alone is seldom a sufficient guide to practices at the grower level that are appropriate to the detailed requirements of today's broiler market. Specific negotiations in such areas as quality and volume of production are necessary if successful coordination is to be achieved. Although the role of price is changed as a result of increased direct negotiation on specifications, it nevertheless is an important area of decision in itself.

Several considerations in relation to producer prices paid for California broilers bear on the role of price in grower-processor coordination. First, are producer prices paid in California systematically related through assembly, processing, and transfer costs to those paid in other areas? Second, do

producer prices in California move together with those in other areas? Finally, if these two questions are answered affirmatively, and prices paid to California broiler producers are a function of a so-called "national broiler market," how are prices used to coordinate grower and processor activities?

The first question involves the theory of interregional trade. California broiler production does not meet the consumption requirements of the state. Processed broilers are shipped into the state's markets in large quantities (Table 4), principally from southeastern and South Central states. Theory suggests that California producer prices should be related to producer prices in these other areas through differences in costs of assembly, processing, and transportation to market. Although a detailed analysis of these costs is beyond the scope of this study, certain approximations should indicate the nature of the expected relationships.

Consider shipments of processed broilers to San Francisco from a southeastern area such as North Georgia and from the San Joaquin Valley of California. Differences in prices paid to producers in these two areas ($P_{(NGa)}$ and $P_{(SJV)}$) would be expected to reflect transportation costs to the market ($T_{(NGa)}$ and $T_{(SJV)}$), processing costs ($C_{(NGa)}$ and $C_{(SJV)}$), and costs of assembling birds for processing ($A_{(NGa)}$ and $A_{(SJV)}$). If it is assumed that San Francisco retailers pay the same price ($P_{(SF)}$) regardless of location of production, the following equations should hold:

$$P_{(SF)} = P_{(SJV)} + T_{(SJV)} + C_{(SJV)} + A_{(SJV)} \quad (1)$$

$$P_{(SF)} = P_{(NGa)} + T_{(NGa)} + C_{(NGa)} + A_{(NGa)} \quad (2)$$

Setting equation (1) equal to equation (2) under the assumption of equal prices, these can be written:

$$P_{(SJV)} - P_{(NGa)} = (T_{(NGa)} - T_{(SJV)}) + (C_{(NGa)} - C_{(SJV)}) + (A_{(NGa)} - A_{(SJV)}). \quad (3)$$

Available data on transportation rates in 1957 indicate that the difference in transportation cost to San Francisco ($T_{(NGa)} - T_{(SJV)}$) is equal to approximately 2.8 cents per pound.[1/]

1/ The Georgia to San Francisco rate for fresh poultry in 1957 was reported as 3.31 cents per pound in the following publication: U. S. Agricultural Marketing Service, Interstate Trucking of Fresh and Frozen Poultry Under Agricultural Exemption, Marketing Research Report No. 224 (Washington, 1958), p. 78.

Cost of transportation of processed broilers from San Joaquin Valley points to San Francisco was estimated to be about .5 cent per pound on the basis of the transportation cost function developed in the following publication: William R. Henry and Charles E. Bishop, North Carolina Broilers in Interregional Competition, North Carolina State College, Agricultural Economics Information Series No. 56 (Raleigh, 1957), p. 10.

Differences in processing costs may exist for a number of reasons. The great majority of California processors handle very small volumes of broilers. The average number of birds handled per hour by the plants surveyed was approximately 1,400; however, these ranged from 350 up to 3,000. Since this study was heavily oriented to the state's larger plants, it would seem reasonable to assume that the average capacity of all plants in California is much lower than this average. A recent study in North Carolina estimated that total broiler processing costs per pound in model plants would be 3.809 cents per pound for a 600 bird-per-hour capacity plant, 3.238 cents for a plant of 2,400 bird capacity, and 3.073 for a 4,800 bird capacity plant.[1] A New England study reported model plant costs of 3.803 cents per pound in a 600 bird-per-hour capacity plant and 2.969 cents per pound in a 3,600 bird-per-hour plant.[2] Although no recent Georgia data are available, a Texas study in 1957 indicated that broiler processing plants in that state usually operate between 1,200 and 3,000 birds-per-hour.[3] This area is probably more comparable to Georgia than is California.

It has been indicated that differences in labor costs are the most important source of variation of processing costs between regions.[4] It can be assumed that processing labor costs vary in proportion to other manufacturing labor costs in each region. Data for May, 1958, published by the Bureau of Labor Statistics showed average hourly earnings of production workers in manufacturing in California to be $2.42 and those in Georgia to $1.50, a difference of 92 cents per hour.[5] It has been estimated that 1.27 hours of labor would be required to process 100 pounds of broilers in a model plant with an hourly capacity of 2,400 birds.[6] Hence, a variation of 10 cents per hour in wage

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1/ James R. Donald and Charles E. Bishop, Broiler Processing Costs, North Carolina State College, Agricultural Economics Information Series No. 59 (Raleigh, 1957), p. 37.

2/ George B. Rogers and Edwin T. Bardwell, Marketing New England Poultry, Part 2: Economies of Scale in Chicken Processing, New Hampshire Agricultural Experiment Station Bul. 459 (Durham, 1959), p. 16.

3/ G. J. Mountney and F. A. Gardner, Processing Texas Broilers, Texas Agricultural Experiment Station Bul. 857 (College Station, 1957), p. 8.

4/ William R. Henry, "Broiler Production Regions of the Future," Journal of Farm Economics, vol. 39, no. 5, December, 1957, p. 1192.

5/ U. S. Bureau of Labor Statistics, Employment and Earnings, vol. 5, no. 1, July, 1958, p. 66.

6/ Donald and Bishop, p. 31.

Differences in production costs may exist for a number of reasons. The price of a bushel of California processing tomatoes varies with small volumes of harvest. The average number of trucks has fed per hour up the planes harvested has varied widely 1,400; however, these rates from 250 up to 1,700. Since this crop was heavily concentrated in the Central Valley plants, it would seem reasonable to assume that the average capacity of all plants is sufficiently high that the average. A recent study in North Carolina estimated that total fixed costs (machine costs per year in total plants would be 3,000 cents per ton of tomatoes for a plant-per-hour capacity. Thus, 3,000 cents for a plant of 2,000 tons capacity, and 1,000 for a 1,000 total capacity plant.[1] A Ohio plant study reported total plant costs of .01 cents per ton in a 600 ton-per-hour capacity plant and 2,000 cents per ton in a 1,500 ton-per-hour plant.[2] Although no recent cost data are available, a study in 1957 indicated that processing plants in California tend to have actually operated between 1,500 and 2,000 ton-per-hour capacity.[3] This area is probably more comparable to Georgia than an California.

It has been indicated that differences in labor costs may be the most important factor of variations of production costs between regions.[4] It was assumed that processing labor costs vary in proportion to other production labor costs in each region. Data for July 1958, published by the Bureau of Labor Statistics, showed average hourly earnings of production workers in canning tomatoes in California to be $2.14 as shown in Georgia at $1.43, a difference of 71 cents per hour.[5] It has been estimated that 1.27 hours of labor would be required to process 100 cases of tomatoes in a model plant with a capacity of 2,000 cases.[6] Hence, a variation of 71 cents in wage rates would

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1/ James E. Langdon and Charles E. Brown, Tomatoes Processing Costs, North Carolina State College, Agricultural Economics Information Series No. 59 (Raleigh, 1957), p. 27.

2/ Henry B. Barger and Edwin T. Schmidt, Processing Tomatoes Costs, Ohio Agricultural Experiment Station Bul. 761 (Wooster, 1957), p. 32.

3/ [illegible] J. [illegible], Processing Tomato Costs, [illegible] Agricultural Experiment Station Bul. 797 (College Station, 1957), p. 8.

4/ William H. Meyer, "Earlier Mechanization Begins of the Future," Farm Economics, vol. 39, no. 5, December, 1957, p. 1127.

5/ U. S. Bureau of Labor Statistics, Employment and Earnings, vol. [illegible], July, 1958, p. 64.

6/ Donald and Hanger, p. 71.

rates corresponds to a difference of .127 cent per pound in processing costs in such a plant. Although this is a higher capacity than that in most California plants, even this difference in labor costs would mean a processing cost that is 1.17 cents per pound higher in California than in Georgia.

These considerations of scale of plant and labor costs suggest that processing costs in California are at least 1 to 1.5 cents per pound higher than those in Georgia. Therefore, if assembly costs are assumed equal in both areas, producer prices in California would be expected to be approximately 1.3 to 1.8 cents per pound higher, using the model indicated by equation (3) above. The actual differences for the years 1955 through 1958 averaged 2.02 cents per pound; however, the 1958 difference was only 1.57 cents (Appendix Table A-2).

In answer to the second question posed, it was found that prices paid to California broiler growers are highly correlated with prices paid in the southeastern production areas. Analysis of prices paid for live birds at the farm in North Georgia and those paid in the San Joaquin Valley for the years 1955 through 1958 showed a correlation coefficient of .96 (Appendix Table A-2). Since the production areas represented by these data are believed to be typical of the Southeast and California, these results lead to the conclusion that prices in the two areas move up and down together. However, it must be recognized that month-to-month comparisons would show varying degrees of correlation.

If it is assumed that transportation and assembly costs remained constant during the years covered and that the difference in processing costs remained the same, the following model can be used: $P_{(SJV)} = a + b\ P_{(NGa)}$. The regression coefficient b indicates the relationship of a price change in North Georgia to the San Joaquin Valley price during the period covered by the data used. Calculation of this regression coefficient by the method of least squares resulted in a value of 1.08.[1/] This value is not significantly different from

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1/ $P_{(SJV)} = a + b\ P_{(NGa)}$

$$b = \frac{\text{Std. Dev. (SJV)}}{\text{Std. Dev. (NGa)}} \cdot r_{(SJV)\ (NGa)}$$

$$= \frac{.3877}{.3455} \cdot .9633 = 1.0809$$

[illegible]

[illegible]

[illegible]

1.0 at the 5 per cent level of significance.[1/] From this it seems reasonable to conclude that as prices change in North Georgia, equivalent price changes occur in the San Joaquin Valley. The a coefficient, representing the difference in costs of transportation, assembly, and processing between the two areas under the assumed conditions was calculated as .43 cents per pound, using these data.[2/]

Another comparison of these intermarket relationships is presented in Table 8. Average delivered prices for 1957 in various markets are adjusted by the transportation rates from different surplus producing areas. The resulting prices, shown as f.o.b. plant, would be expected to move toward equality as equilibrium conditions were approached. That these "f.o.b. plant prices" tend to be equalized by this transportation cost adjustment can be seen from Table 8. The difference in these prices can probably be largely attributed to defects in the data used, market imperfections, and the fact that during the period covered the rapid growth of the broiler industry in these producing areas was causing widespread shifts in marketing patterns.

In view of these various considerations, it seems reasonable to conclude that California-produced broilers are sold in markets which are a part of a "national broiler market." Price levels for processed birds of comparable form

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1/ Hypothesis: $b = 1.0$

$$t = \frac{b - 1}{\sqrt{\dfrac{S^2_{(SJV)} \cdot (NGa)}{n\, S^2_{(NGa)}}}} = \frac{1.08 - 1.0}{\sqrt{\dfrac{.01095}{5.74656}}} = 1.83$$

At the 5 per cent level of significance, reject if $-2.01 > t > 2.01$.

2/ $a = \overline{P}_{(SJV)} - b\,\overline{P}_{(NGa)}$

$= 21.81 - 1.08\ (19.80)$

$= .43$

[illegible] at the [illegible] [illegible] [illegible]

TABLE 8

Approximate F.O.B. Plant Prices of Ready-to-Cook Broilers in Selected Producing Areas Computed from Market Prices of Transportation Rates, 1957

Area	Markets					
	Los Angeles[a]	Chicago	Cincinnati	Detroit	Phila-delphia	St. Louis
	cents per pound					
Georgia:						
Average delivered price	33.10	30.75	31.33	30.94	32.62	30.51
Less transportation cost	3.00	1.33	1.23	1.58	1.68	1.38
F.o.b. plant	30.10	29.42	30.10	29.36	30.94	29.13
Arkansas:						
Average delivered price	33.10	30.75	31.33	30.94	32.62	30.51
Less transportation cost	1.83	1.28	1.27	1.53	1.82	.32
F.o.b. plant	31.27	29.47	30.06	29.41	30.80	30.19
Mississippi:						
Average delivered price	33.10	30.75	31.33	30.94	32.62	30.51
Less transportation cost	2.50	1.42	—[b]	1.00	—	1.02
F.o.b. plant	30.60	29.33		29.94		29.49
Texas:						
Average delivered price	33.10	30.75	31.33	30.94	32.62	30.51
Less transportation cost	1.42	—	—	1.60	2.35	.80
F.o.b. plant	31.68			29.34	30.27	29.71

(Continued on next page.)

TABLE 6

Prudhoe Bay, Alaska, Field data on average-size oil wells to indicate incremental [illegible]
[illegible] Department [illegible] Alaska [illegible]

Item	Operations				
	Loss factor[a]	Drilling	Production	Lease	Drilling and lease
	Costs per barrel				
Operating:					
Operating dollars per barrel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Less transportation on [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Capital:					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Less transportation on [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Depletion:					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Less transportation [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Taxes:					
Ad valorem [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Less transportation [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

Table 8 continued.

a/ No delivered price in Los Angeles for 1957 is available; however, applying the spread between the 1958 price to retailers in Los Angeles and the 1958 delivered price, which is available, to the 1957 price to retailers, the delivered price shown was obtained.

b/ Blanks indicate not available.

Sources:

Average delivered prices: U. S. Agricultural Marketing Service, Dairy and Poultry Market Statistics, 1958, Statistical Bulletin No. 252 (Washington, 1959), pp. 112-113.

Transportation rates: U. S. Agricultural Marketing Service, Interstate Trucking of Fresh and Frozen Poultry Under Agricultural Exemption, Marketing Research Report No. 224 (Washington, 1958), p. 78.

and quality are set within the framework of this national market. However, prices are used for other important functions in the California grower-processor relationship.

Processors utilize price guarantees and price differentials as competitive devices to obtain live broilers from particular growers, to assure themselves of adequate, continuous supplies, and to encourage growers to supply birds with specific differentiating characteristics.

Price uncertainty is specifically reduced for those growers and grower-contractors having minimum price contracts with processors. Although the price guarantee and method of price determination is the principal feature of these contracts, they also eliminate the uncertainty of finding sales outlets for the birds covered. Many processors wish to assure themselves of supplies from particular growers with whom they have had successful relationships over time. A contract including a minimum price provision may be used for this purpose.

Prices for live birds possessing desired specifications, principally certain weights, usually vary from the published market price in some stipulated manner. For instance, one grower-processor contract provided that the grower supply 2,500 2½-pound birds per week and 7,000 birds weighing over 3¼ pounds for a guaranteed minimum price of 20 cents per pound or the applicable Market News price on the day of delivery if it was over 20 cents, but with a stated maximum of 24 cents.

Specific prices to be paid for live broilers by California processors studied were not indicated in formal or informal agreements with suppliers. The price paid for each lot was based upon the "market" at the time of delivery for processing; however, nearly all the formal, written contracts contained some guaranteed minimum price and/or a specific relationship to market price on day of delivery, such as a fixed differential from the high, low, or average price reported by the Federal-State Market News Service (Table 7).

The market price used was the Market News daily price reported in the particular processor area. This daily price is reported by a Market News representative in each of the three principal broiler processing areas in California--Los Angeles, San Francisco, and Fresno (for the San Joaquin Valley). In each of these areas, this representative contacts individual buyers of live birds and from their daily purchase prices determines the approximate price range of the day's sales to processors. This price is published in a Market News Report for each area and is circulated to all interested parties.

If there is no written contract between the processor and live-bird supplier, the price paid on delivery is usually the appropriate Market News

price or the processor price for that day. The processor price, under these conditions, reflects not only expected sales prices for the final product but also processing margin, present and prospective live-bird supply, and price quotations from competing out-of-state areas. These quotations are generally known by California processors prior to their own price determination, since out-of-state processors must quote their sales prices in advance of delivery dates because of transportation time. California processors who purchase inshipped birds for resale and those which are a part of a national company with plants in other processing areas have direct access to out-of-state quotations. In addition, the Market News Service obtains a daily live-bird price from three of the principal broiler-producing states and indicates this average on the daily report.

Among processors surveyed, about 35 per cent of the birds purchased were obtained under formal contracts which included a minimum price guarantee provision (Table 6). The others were subject to a price made on the day of delivery--either the Market News price, with or without some specified differential, or the processors' paying price for that day.

IV. Conclusion

This study has emphasized the factors requiring coordination of decision making in areas of mutual interest between the processor and his suppliers of live birds. Three such areas have been discussed in detail: (1) quality of live birds, (2) volume and timing of placements and deliveries, and (3) price. Many of the developments which have had an important bearing on processors' relationships with their suppliers of live birds, and also with their sales outlets, have resulted from broad changes in the broiler industry. Considerations related to the state of the industry involve: (1) the rapidity of industry development and the consequent need for effective and easy communication between segments in order to pass on large amounts of technological or market information, (2) the existence of generally accepted rules of procedure and conduct of interfirm transactions, (3) the extent of development of specialized agencies to handle specific functions, and (4) the financial strength of the industry members.

The rapid development of the broiler industry in the United States since World War II is well known. Much of this development has involved new production areas and new producers who have come from considerably different farming pursuits. In these areas and in relation to these producers, the rapidity of this development has led to complex problems of information exchange, and with no previously existing channels of communication these problems have resulted in new ways of transmitting and translating information into performance.

price on the processor price for that day. The processor price, under these circumstances, reflects not only expected sale price for the final product but also processing margin, present and prospective live-bird supply, and other factors. These factors are, generally known by participants in processor price to their price determination, price outlook for the processors must make their sales prices in advance of delivery dates because of transportation time. California processors who purchased dressed stock for resale and those who are a part of a vertical company with plants in other processing areas have direct access to out-of-state markets. In addition, the largest area dressers obtain a daily live-bird price from one of the principal poultry-producing areas and indicate this average as the daily price.

Some processors surveyed, about 25 per cent of the birds purchased were delivered under formal contracts which included a minimum price guarantee provision (price 2). The others were subject to a price made on the day of delivery--either the market price or some other, with or without some specified differential, as the processors' paying price for that day.

IV. Conclusions

This study has emphasized the indirect requiring coordination of decision making in many of multiple transfers between the processor and the producers of live birds. These areas have been discussed in detail: (1) Quality of live birds, (2) volume and timing of placements and deliveries, and (3) price. Many of the developments which have had an important bearing on processor relationships with their poultry producers of live birds, and also with their sales outlets, have resulted from broad changes in the broiler industry. Contributing related to the areas of the industry revolves: (1) the rapidity of industry development and the consequent need for effective and easy communication between segments in the course in case on large scale of technological or market information, (2) the influence of geographic concepts makes of producers and contact of influence relationships, (3) the extent of development of specialized agencies to handle growth in locations, and (4) the financial strength of the industry leaders.

The rapid development of the broiler industry in the United States since World War II is well known. Most of this development has involved new production areas and new producers who have come from considerably different farming areas. In these areas and in relation to these producers, the capability of the development has led to complex problems of information exchange, and also to increasingly exacting standards of performance of these producers over requisites in the way of transmitting and evaluating information into performance.

As important as the changes in the California broiler industry have been in the past decade or so, they have not been as great nor have they changed the character of the state's poultry industry as much as have the corresponding developments in many of the principal broiler-producing states. Although this study indicates that procurement sources of California processors have shifted somewhat due to organizational changes in the producing segment of the industry, these sources have not changed such as to demand a substantial remolding of the institutional structure of the processing segment. As the volume of market information (such as buyer specifications) and the technical information (such as that concerning production techniques) increased, existing channels of communication were strained; however, improvements and additions rather than abandonment were the result. Recognized rules for intraindustry relationships were well established, although revision was required in the light of industry changes.

None of these changes has been independent of the others. In particular, this applies to the development of specialized agencies which usually accompanies industry growth. As the broiler industry expanded and increased operating capital was required by growers, the various intermediary financing agencies developed between the traditional lending institutions and the producers. These agencies, usually input-supplying firms with a direct interest in broiler volume, not only added their financial strength to that of the producers but performed specialized services varying from complete supervision to marketing advice and aid.

As a consequence of these developments, these intermediary agencies, grower-contractors, and financing input suppliers are either the principal sources of processor supplies of live birds or are closely involved in the procurement relationship. Nevertheless, the interfirm arrangements that have developed in the California industry are not characterized by formal agreements. Most of the processor-supplier arrangements are on an informal basis, often a continuing, verbal agreement. The success of these informal relationships may be due to several factors. One is the fact that the California industry is relatively stable compared to some of the states in which broiler production has expanded so rapidly since World War II. Second, the success of the intermediary agency in maintaining and expanding California production and in coordinating with the processor has apparently lessened the need for formal arrangements to insure desired specifications. Uniformity of product has been enhanced through this type of centralized supervision, and other production problems that might tend to encourage grower-processor integration have been reduced. A third factor is the general prevalence of small-scale processors. The great majority of the

In conclusion as the changes in the Siberian frontier industries have been [illegible] they have not been so great as needs can have any close and [illegible] connection of the Siberian poultry industry as much as have the non-economic [illegible] which in any case in this instance be time-consuming either. Although this study indicates that [illegible] of Siberian production have shifted somewhat due to organizational changes in the marketing segment of the industry, there have been no basical such as to bound a substantial regarding of the institutional structure of the production segment. In the words of modern [illegible] (such as upper production [illegible]) and the individual interaction (such as but concerning production [illegible]) [illegible], emphasis on [illegible] of [illegible] [illegible] [illegible]

state's processors, handle less than 5,000 broilers per week, and most of these probably handle less than 1,000 per week. Under these conditions, informal arrangements can easily be maintained with suppliers to assure adequate volumes and qualities of birds.

In adjusting to the existing conditions in the broiler industry, California processors interviewed were taking one of the following five courses of action at the time of this study: (1) expansion or improvement of existing facilities in order to process higher volumes and/or lower processing costs to enable them to compete more effectively with inshipped birds; (2) change to a specialized type of operation, such as packing cut-up birds only, in order to cater to buyers desiring these special services; (3) maintenance of existing facilities and operations in avoidance of any major change until the future of the California industry becomes more evident; (4) engagement in wholesale handling of inshipped broilers to a limited degree in addition to maintenance of existing operations; (5) switching the primary emphasis of the business to wholesaling of inshipped broilers and other products processed elsewhere.

Among the processors studied, five, including most of the larger operations, were expanding or improving their facilities as indicated in alternative number 1. Several of these firms were also engaged in wholesaling inshipped birds. Four processors were turning to specialized operations as indicated in alternative number 2, and five processors, including both large and small firms, were following alternative number 3, attempting to maintain their present position. Four firms were handling small amounts of inshipped broilers as in alternative number 4, and three processors had markedly reduced their processing operations within the past few years and were shifting to wholesaling of inshipped broilers as the primary function of the business.

In general, the adjustments being made by California processors studied were placing increased emphasis on the distributive phase of their operations. None of the courses of action indicated included more direct entry into the production of live birds either through contract or ownership. If anything, the trend was in the other direction. Two firms, for example, whose primary business was in areas below the processing level, moved into the operation of processing plants. In both instances, this had occurred during the year preceding this study and was considered largely experimental by the companies involved. Those few firms that were producing their own birds indicated that this was a minor and declining phase of their business. At least one large processor had discontinued a contract growing operation just prior to this study.

state's processors, handle less than 5,000 broilers per week, and most of these probably handle less than 1,000 per week. Under these conditions, informal arrangements can easily be maintained with suppliers to assure adequate volumes and qualities of supply.

In adjusting to the existing conditions in the broiler industry, California processors interviewed were taking one of the following five courses of action at the time of this study: (1) expansion or improvement of existing facilities in order to process higher volumes and/or lower processing costs in order that it compete more effectively with imported birds; (2) change to a specialized type of operation, such as parts, or cut-up birds only, in order to cater to higher [illegible] special services; (3) maintenance of existing facilities and operations in expectation of any major change until the future of the California industry becomes more evident; (4) engagement in wholesale handling of imported broilers to a limited degree in addition to maintenance of existing operations; (5) switching the primary emphasis of the business to wholesaling of imported broilers and other products processed elsewhere.

Among the processors contacted, five, including some of the larger operations, were expanding or improving their facilities as indicated in alternative number 1. Several of these firms were also engaged in wholesaling imported birds. Four processors were turning to specialized operations as indicated in alternative number 2, and five processors, including both large and small firms, were following alternative number 3, attempting to maintain their present position. Four plants were handling small amounts of imported broilers as in alternative number 4, and three processors had markedly reduced their processing operations within the past few years and were shifting to wholesaling of imported broilers as the primary function of the business.

In general, the adjustments being made by California processors suggest the [illegible] increased emphasis on the distributive phase of their operations. Some of the sources of supply included integrated operations, with the problem of long [illegible] either through purchase or ownership. In addition, the trend was in the same direction. The flocks, for example, where primary business was in areas where the growers had [illegible] into the expansion of processing plants. In one instance, this had occurred during the past year and the plant was not considered fully independent by the integrated growers. Quite few firms were purchasing their own birds, indicated that this was a [illegible] and [illegible] phase of their business. In fact, one large processor had discontinued a separate poultry operation and turned to this area.

Processors interviewed believed that the unsettled conditions prevailing in the California industry were due primarily to the impact of inshipped, ice-packed birds upon local markets and the changing nature of producer credit sources and contract arrangements involving various input suppliers. In view of these conditions, most of these processors were moving cautiously in the adjustment of their own operations.

Economies observed included that the unskilled conditions prevailing in the industrial industry were due primarily to the issues of land, lack of capital, dependence upon local markets and the changing nature of produce crops. Difficulties encountered included lowering wages during hard times. In view of these circumstances, each of these processors were looking cautiously in the advisability of initiating new operations.

APPENDIX A

APPENDIX TABLE A-1

Annual Commercial Broiler and Fryer Production
California, 1942-1957a/

Year	Number of birds raised	Average live weight	Pounds produced
	thousand	pounds	thousand
1943	11,480	2.7	30,996
1944	18,024	3.0	54,072
1945	27,577	3.1	85,489
1946	17,925	3.3	59,152
1947	20,793	3.2	66,538
1948	21,833	3.2	69,866
1949	28,601	3.2	91,523
1950	39,469	3.4	134,195
1951	47,757	3.3	157,598
1952	48,235	3.3	159,176
1953	48,717	3.3	160,766
1954	50,179	3.2	160,573
1955	48,516	3.1	150,400
1956	52,397	3.3	172,910
1957	43,490	3.3	139,168

a/ Includes only heavy breed and heavy crossbreed chickens.

Source: California Crop and Livestock Reporting Service, Poultry and Hatchery Production in California, Summary for 1957 (Sacramento, 1958), p. 7.

APPENDIX TABLE A-1

Annual Consumption Quotas and Actual Production
Oklahoma, 1950-1959

Year	Production quota	Actual production	Actual production as percent of quota
	Thousand pounds		Percent
1950	11,500	4.7	40.866
1951	24,654	3.0	21.072
1952	17,377	1.3	7.480
1953	17,925	3.3	18.412
1954	40,395	1.4	3.538
1955	21,895	1.1	5.160
1956	16,200	3.1	19.753
1957	15,465	3.4	22.025
1958	41,171	4.1	10.139
1959	44,255	3.1	7.000
1960	46,172	1.3	2.846
1961	40,320	2.5	6.273
1962	46,240	3.1	6.700
1963	55,391	3.3	6.000
1964	49,460	3.3	6.700

a/ Includes milk cows bred and heavy crossbreed calves.

Source: California Crop and Livestock Reporting Service. Figures are taken from Economic Indicators for 1963 (Sacramento, 1963), p. 1.

APPENDIX TABLE A-2

Live Broiler Prices Paid at the Farm in North Georgia and in the San Joaquin Valley, California, 1955-1958

Month	North Georgia	San Joaquin Valley
	monthly average prices, cents per pound	
1955		
January	23.86	25.24
February	25.06	26.42
March	28.73	31.47
April	27.38	30.00
May	26.66	29.50
June	26.22	29.52
July	25.50	28.12
August	26.00	29.00
September	23.54	27.40
October	20.61	22.38
November	19.90	21.18
December	18.82	19.76
1955 average	24.36	26.67
1956		
January	20.44	21.00
February	20.75	21.28
March	20.94	21.55
April	19.74	21.64
May	20.22	21.93
June	19.05	22.55
July	20.31	23.94
August	18.79	21.82
September	17.32	20.56
October	16.38	18.29
November	16.20	16.48
December	15.22	19.51
1956 average	18.72	20.88
1957		
January	17.15	20.96
February	18.74	20.28
March	18.44	22.19
April	17.86	20.28
May	18.73	20.59
June	20.10	22.00
July	20.70	22.76
August	19.75	22.45
September	17.25	19.93
October	16.25	16.52
November	16.30	17.06
December	16.12	17.01
1957 average	18.12	20.16

(Continued on next page.)

TABLE 1.-2

Area Studies Indoor Test at the Farm in Yorba Linda, and in the San Gabriel Valley, California, 1971-1973

Month	Yorba Linda	San Gabriel Valley
	Average area index, cm² per plant	
1971		
January	12.00	12.50
February	15.00	13.00
March	17.25	11.00
April	17.50	17.00
May	15.00	15.00
June	20.00	15.00
July	20.00	12.00
August	20.00	20.00
September	17.50	17.00
October	21.00	15.00
November	16.00	15.00
December	12.00	10.75
1971 average	17.5	14.17
1972		
January	10.00	21.00
February	20.00	21.00
March	20.00	21.00
April	20.00	21.00
May	20.00	20.00
June	20.00	20.00
July	20.00	20.00
August	17.50	21.00
September	17.50	15.00
October	17.50	15.00
November	15.00	10.00
December	15.00	12.00
1972 average	18.75	18.00
1973		
January	12.50	10.00
February	15.00	20.00
March	20.00	20.00
April	15.00	20.00
May	20.00	20.00
June	20.00	20.00
July	20.00	20.00
August	25.00	20.00
September	25.00	20.00
October	25.00	20.00
November	17.50	20.00
December	17.50	20.00
1973 average	20.00	20.00

(continued on next page.)

Appendix Table A-2 continued.

Month	North Georgia	San Joaquin Valley
	monthly average prices, cents per pound	
1958		
January	19.99	20.76
February	19.86	20.87
March	20.81	23.86
April	18.73	20.99
May	19.73	21.17
June	20.38	22.05
July	18.34	20.52
August	16.89	19.09
September	15.77	16.28
October	15.32	15.91
November	15.03	17.26
December	14.55	15.48
1958 average	17.95	19.52
1955-1958 average	19.80	21.81

Source: U. S. Agricultural Marketing Service, Dairy and Poultry Market Statistics, 1955, Statistical Bulleton No. 173 (Washington, 1956), pp. 87 and 82; 1956, Statistical Bulletin No. 219 (1957), pp. 121 and 116; 1957, Statistical Bulleton No. 227 (1958), pp. 110 and 105; and 1958, Statistical Bulleton No. 252 (1959), pp. 99 and 103.

Appendix Table 1-2 continued.

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
January	12.52	[illegible]
February	12.52	[illegible]
March	20.32	[illegible]
April	18.72	[illegible]
May	12.72	[illegible]
June	20.32	[illegible]
July	[illegible]	[illegible]
August	18.[illegible]	12.[illegible]
September	18.72	[illegible]
October	18.32	12.[illegible]
November	12.07	12.[illegible]
December	12.[illegible]	12.[illegible]
1-20 average	17.[illegible]	12.[illegible]
21-[illegible] average	12.[illegible]	21.[illegible]

Source: U. S. Weather Bureau Monthly Summary, Climatological Data, Kansas, [illegible] Station, [illegible]; Total Monthly Rainfall, [illegible]; Lawrence, [illegible] No. [illegible] and [illegible]; Climatological Bulletin No. [illegible] (1[illegible]), No. [illegible] and [illegible]; [illegible] Bulletin No. [illegible] (1[illegible]), No. [illegible] and [illegible]; Climatological Bulletin No. [illegible] (1[illegible]), No. [illegible] and [illegible]; Climatological Bulletin No. [illegible] (1[illegible]), No. [illegible] and [illegible].

APPENDIX B

Estimates of California Consumption of Broilers, 1957

1. U. S. Department of Agriculture estimates that the 1957 per-capita consumption of chicken meat was 25.3 pounds for the United States as a whole. It also estimates that 73 per cent of this consumption, or 18.5 pounds, was broiler meat.[1]

   The California Department of Finance estimated the population of California on July 1, 1957, as 14,160,000 persons.[2]

   These figures indicate a total California broiler meat consumption of 261,960,000 pounds during 1957. Using an average dressed weight of 2.5 pounds per bird, this would mean a consumption of approximately 104,784,000 birds in that year.

2. The U. S. Department of Agriculture survey of household food consumption in 1955 estimated that western households used 1.74 pounds of chicken meat per week. This would indicate an annual consumption of 90.48 pounds.[3] Using the U. S. Department of Agriculture estimate of 73 per cent broiler meat, this would give a per-household consumption of 66.05 pounds of broiler meat.[4]

   This household survey also estimated that the average western household consisted of 3.22 persons.[5] Using the 1957 population figure of 14,160,000, this per-household figure yields an estimate of 4,397,515 households. This number of households, multiplied by the per-household consumption estimate, gives a total California consumption estimate of 290,455,866 pounds of broiler meat. At 2.5 pounds average dressed weight, this indicates an annual consumption of 116,182,346 birds.

1/ U. S. Agricultural Marketing Service, The Poultry and Egg Situation, PES 192 (Washington, 1957), Table 9, p. 21.

2/ California Department of Finance, Population of California Areas and Counties, 1957 (Sacramento, 1957), p. 1.

3/ U. S. Department of Agriculture, Household Food Consumption Survey: 1955, Food Consumption of Households in the West, Report No. 5 (Washington, 1957), Table 10, p. 69.

4/ U. S. Agricultural Marketing Service, The Poultry and Egg Situation.

5/ U. S. Department of Agriculture, Household Food Consumption . . ., Table 2, p. 7.

APPENDIX I

Estimates of Industrial Consumption of Jute Goods, 1971

1. [illegible] Department of Agriculture estimated that in 1970 industrial consumption of jute goods was [illegible] tons in the United [illegible] as a whole. It also estimated that 75 per cent of this consumption of [illegible] was in [illegible].[1]

The Industrial Department of Commerce estimated the consumption in Calcutta in 1971 [illegible] at [illegible] tons.[2]

These figures include a [illegible] consumption [illegible] production of [illegible] tons [illegible] 1971. [illegible] consumption [illegible] of 2.5 [illegible] per head, which [illegible] consumption of approximately [illegible] tons in that year.

2. The U. S. Department of Commerce [illegible] in [illegible] 1970 [illegible] of [illegible] consumption [illegible] of [illegible] tons. This would indicate an annual [illegible] of 0.16 [illegible].[3] Using the U. S. Department of Commerce [illegible] of 73 per cent [illegible], this would give a per-[illegible] consumption of 0.[illegible] [illegible].[4]

This would suggest that [illegible] the average [illegible] consumption is [illegible] of 1.02 [illegible].[5] [illegible] 1970 [illegible] figure of [illegible], this per-[illegible] figure [illegible] of [illegible]. This [illegible] of [illegible] per-[illegible] consumption [illegible], [illegible] total [illegible] consumption [illegible] of [illegible] [illegible]. [illegible] consumption [illegible] [illegible].

1/ [illegible] Bureau [illegible] Commerce, [illegible], 1971, Table 9, p. [illegible].

2/ [illegible] Department of Commerce, [illegible] [illegible], 1971 [illegible], p. [illegible].

3/ U. S. Department of Commerce, [illegible] [illegible], 1970, [illegible] of [illegible], p. [illegible].

4/ U. S. Department of Commerce, [illegible] [illegible], p. [illegible].

5/ [illegible]